No. 2015-1634, -1635

United States Court of Appeals for the Federal Circuit

WIRELESS MEDIA INNOVATIONS, LLC,
Plaintiff-Appellant,

v.

MAHER TERMINALS, LLC,
Defendant-Appellee,

AND

GLOBAL TERMINAL & CONTAINTER SERVICES, LLC,
Defendant-Appellee.

Appeals from the United States District Court for the District of New Jersey in Nos. 2:14-cv-07004-JLL-JAD and 2:14-cv-07006-JLL-JAD, Judge Jose L. Linares.

PLAINTIFF-APPELLANT WIRELESS MEDIA INNOVATIONS, LLC'S APPEAL BRIEF

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17 July 2015

CERTIFICATE OF INTEREST

1. The full name of every party represented by me is:

   Wireless Media Innovations, LLC

2. There are no other real parties in interest represented by me.

3. Wireless Media Innovations, LLC certifies that it has no corporate parent and there are no publicly held corporations that own 10% or more of its stock.

4. The names of all the firms or lawyers that appeared for the party now represented by me in the trial court or are expected to appear in this court are as follows:

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Dated: 17 July 2015

/s/ *David P. Swenson*
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TABLE OF CONTENTS

TABLE OF AUTHORITIES

Page(s)

Cases

Statutes

Other Authorities

STATEMENT OF RELATED CASES

No other appeal in or from this action was previously before this or another appellate court.

JURISDICTIONAL STATEMENT

Plaintiff-Appellant, Wireless Media Innovations, LLC ("WMI") brings this appeal from the United States District Court for the District of New Jersey in accordance with 28 U.S.C. § 1295(a)(1). *See* Fed. R. App. P. 4(a)(1)(A).

This matter arises under the United States Patent Laws and jurisdiction exists under 28 U.S.C. §§ 1338(a) and 1400(b). WMI appeals the joint orders and judgments of the district court ruling the asserted claims of the patents-in-suit to be unpatentable under 35 U.S.C. § 101. Final judgments were entered in each of these cases on April 20, 2015.[1]

WMI's notice of appeal was timely filed on May 4, 2015, within thirty days of entry of final judgment pursuant to 28 U.S.C. § 2107.[2]

[1] JA1-2.
[2] JA647-50 (Wireless Media's Notice of Appeal in 2:14-cv-07004 and -07006).

STATEMENT OF THE ISSUES

(1) Did the district court err by determining, in *Alice* step one, that the claims of WMI's '291 and '789 Patents[3] covering a concrete, networked combination of devices and related methods for monitoring and moving shipping containers in a physical receiving yard, cover nothing more than an abstract idea, and thus are not directed to patent-eligible subject matter under 35 U.S.C. § 101?

(2) Did the court err in deciding that the claimed combinations of distributed hardware, software, communications devices, and computer equipment fail to transform the abstract idea into a patent-eligible invention under section 101?

(3) Did the district court err in dismissing WMI's complaints for failure to state a claim, without allowing for claim construction, or considering whether any fact questions might preclude dismissal at the pleadings stage under Rule 12(b)(6)?

[3] JA32-77 (U.S. Patent No. 6,148,291); JA78-93 (U.S. Patent No. 5,712,789).

STATEMENT OF THE CASE

This is a consolidated appeal from two cases brought before the United States District Court for the District of New Jersey, in which WMI sued Maher Terminals and Global Terminal & Container Services for infringing U.S. Patents No. 6,148,291 and No. 5,712,789. Maher and Global each moved to dismiss the complaint against it under Fed. R. Civ. P. 12(b)(6), for failure to state a claim on which relief can be granted, based on the purported facial invalidity of all of the claims of the '291 and '789 Patents under 35 U.S.C. § 101 and the Supreme Court's *Alice* decision.[4] The district court ruled that WMI's patents are not entitled to the presumption of validity in this analysis, that 42 claims of the two patents claims can be summarily considered together,[5] and that no claim construction or underlying fact issues existed that merited development in further proceedings. The court then went on to invalidate all of the claims for relating only to patent-ineligible subject matter, covering merely an abstract idea implemented with conventional technology, and lacking any inventive concept to salvage the claims.

STATEMENT OF THE FACTS

I. BACKGROUND AND THE PATENTS-IN-SUIT

The sole inventor of the patents-in-suit, Mr. Joseph Radican, acknowledged in the patents themselves that some aspects of tracking shipping containers in

[4] *Alice Corp. Pty. Ltd. V. CLS Bank Int'l*, 134 S. Ct. 2347 (2014).
[5] WMI volunteered below, despite the early stage of the proceedings, that it will not be asserting '291 Patent claims 21 and 35 or any claims depending from them.

transit were well developed at the time of his invention, in the mid-1990s. However, waste and inefficiency remained in the process at certain stages, which prevented a manufacturer or supplier from accurately calculating a current, real-time accounting of assets. The state of the technology at that time led to difficulties in locating shipments, which generally were only classified simply as having arrived at a location, without detailing anything more.

Mr. Radican come up with an improvement to existing container monitoring systems in the early- to mid-1990s in this field, which involved a concrete, physical combination of computer and mechanical equipment, to make available 24-hour, real-time inventory information. The "basic physical components" of the patented system are depicted in Figure 1 of both patents:

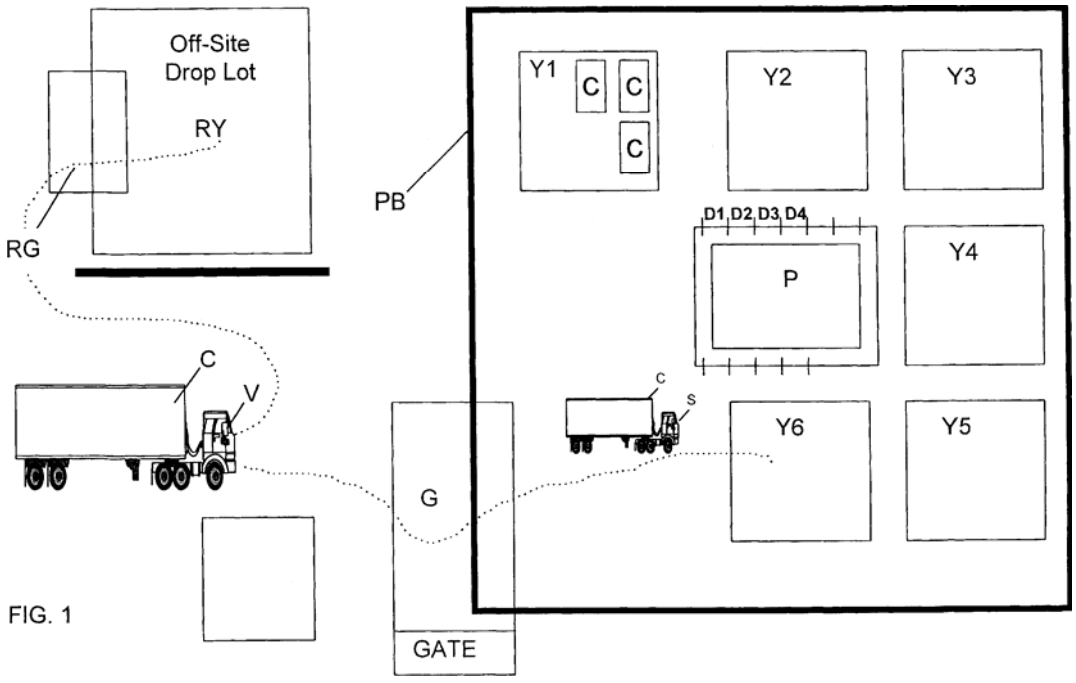

FIG. 1

He filed his first patent application in August 1995, which led to the '789 Patent, issued January 27, 1998; followed by the '291 Patent, issued November 14, 2000.

A. The ’789 Patent

The ’789 patent is titled “Container Monitoring System and Method,” and describes a multifaceted system and method for monitoring and reporting on containers, which tracks the location and load status of containers within defined physical premises.[6] To address the concrete, real-world problems he observed in this field, the inventor proposed an “all-encompassing” computerized container monitoring system that continuously tracked containers, their locations, and their load status.[7] The disclosed monitoring system combines a number of existing technologies in a way that had not been done in the prior art.

The patent teaches the use of RF optical scanners as a means to capture container identification information.[8] The captured information is then maintained in a database on a mainframe computer, which keeps track of the container data.[9] The monitoring system communicates with switching vehicles, and employs specialized software to send instructions to, and to receive information from, the switching vehicles via data transceivers.[10] Using additional specialized software, the monitoring system can analyze the monitored data to detect process inefficiencies, create schedules, and generate reports.[11] Notably, unlike in the prior art, this arrangement of equipment in combination, and networked, ultimately

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[6] JA78 (’789 Patent at Abstract.)
[7] JA87 (’789 Patent at 1:52-2:4.)
[8] JA89 (’789 Patent at 5:25-32.)
[9] JA89 (’789 Patent at 5:2-9.)
[10] JA90 (’789 Patent at 7:35-37.)
[11] JA87, JA89-91 (’789 Patent at 2:20-40, 5:48-51, 7:49-8:2, 8:3-42, 8:43-64, 8:65-9:7.)

allows for "constant and immediate updating of container location and status," providing real-time, remote access to the information collected about the customer's shipments by the patented system.[12]

The '789 Patent includes system claims 1 through 8, and method claims 9 through 19, directed to aspects of the combination of devices and functionality of the inventive system and tracking method. Claim 1 reads as follows:

> 1. A container monitoring system for accumulating and storing information on shipping containers including container location and container load status, the system comprising:
>
> a receiving area for receiving containers to be monitored by the system, said receiving area within a defined boundary within which containers are to be monitored by the system,
>
> a container entry point at the boundary at which containers are identified by pre-existing identification codes which are recorded at the container entry point,
>
> a switching vehicle for moving containers to and from a receiving area and to and from a facility within the boundary according to instructions received from the facility, and
>
> means for recording information on locations and load status of containers within the defined boundary.

This claim, for example, is directed to a tangible, physical combination that includes an area, having a defined boundary, within which containers are monitored, with a receiving area and an entry point where containers are identified by identification codes; switching vehicles which move containers in specific ways within the system according to instructions from a facility within the system; and particular means, such as data terminals, code scanners, RFID tags, mainframe

[12] JA87, JA90 ('789 Patent at 7:29-33, 1:52-2:18).

computers, and databases for recording information on the location and load status of containers. These components—switching vehicles, which could be, for example, trucks, cranes, aircraft, watercraft, or fixed conveyor systems, recording means such as data terminals, code scanners, RFID tags, mainframe computers, and databases, and a physical yard or area where containers are processed (having particular boundaries and entry points, etc.), such as, in the case of Appellees' infringing systems, a shipping port—are configured in such a way as to allow the system to provide "the interactive parties of suppliers, shippers, carriers, and customer with twenty-four hour live data on container location and status."[13]

B. The '291 Patent

The '291 Patent is titled "Container and Inventory Monitoring Methods and Systems," and issued from a continuation-in-part application claiming priority to the 1995 application that issued as the '789 Patent. The '291 Patent expands on the teachings of the '789 Patent, adding further concrete and inventive details. In particular, it describes different types of reports that can be created from the information gathered by the monitoring system.[14] The patent also describes a container searching interface that allows the user to find containers by geographical site.[15] Claim 1 of the '291 Patent reads as follows:

[13] JA87 ('789 Patent at 1:64-67).
[14] JA41-58 ('291 Patent at Figs. 7A-7D, 8A-8B, 9A-9B, 10A-10B, 11A-11F, 12A-12D, JA68 ('291 Patent at 3:51-4:15).
[15] JA57-58, JA73 ('291 Patent at Figs. 12A-12D, 13:55-65).

> 1. A computerized system for monitoring and recording location and load status of shipping containers relative to a facility with an associated yard defined by a boundary within which containers are to be monitored by the system, and a controlled entry point to the boundary, the system comprising:
>
> means for recording identification codes of containers which enter the boundary,
>
> means for communicating and recording information on movements, location and load status of containers within the boundary in response to movement and changes in location and load status of containers made according to instructions received from the facility,
>
> means for generating reports of recorded information on locations and load status of containers within the boundary, and
>
> means for generating reports on container locations and load status relative to designated docks associated with a facility.

This claim, among other things, relies more specifically on four limitations in means-plus-function format, to cover corresponding structure described in the specification, and its structural equivalents. Importantly, neither Appellees below nor the district court attempted to construe the means-plus-function elements of claim 1—or of any of the increasingly narrow 19 dependent claims that derive from claim 1, which by definition incorporate all of the elements of this claim.

II. The District Court's Decision

The district court began its analysis by briefly reproducing a pair of independent claims from each patent, without any discussion of them or their elements, and then declaring that "As the other claims of the Patents are drawn to similar processes, they suffer from the same infirmity as the representative claim and need not be considered further."[16] Next the court quickly dispatched with the

[16] JA8 (Opinion at 6).

notion that the construction of any term of any claim was necessary or could impact the decision on the motion to dismiss, stating that "[t]he 'basic character of the claimed subject matter' in dispute in this action is clearly evident to the Court and no further construction of the claims is required."[17] Finally, all before reaching the merits of the § 101 issue, and without addressing whether any fact issues might exist underlying the legal question before it, the district court then set aside the presumption of validity, relying on Judge Mayer's concurrence in the most recent *Ultramercial* decision: "With no authoritative law binding the Court as to an applicable standard, the Court adopts Judge Mayer's approach and will not afford Plaintiff's Patents the presumption of subject matter eligibility."[18]

Having set the ground rules in this fashion, the district court proceeded to apply the two-step analysis of *Alice* to the "basic character of the claimed subject matter" of WMI's cumulative 42 patent claims, as the court understood it. First, the court determined that all of WMI's patent claims were "directed to the same abstract idea: monitoring locations, movement, and load status of shipping containers within a container-receiving yard, and storing, reporting and communicating this information in various forms through generic computing functions."[19] From there, turning to *Alice* step two, the district court searched in vain for an "inventive concept" to "transform" this abstract idea into patentable

[17] JA9 (Opinion at 7).
[18] JA 11(Opinion at 9); *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 720-21 (Fed. Cir. 2014) (J. Mayer Concurring).
[19] JA16 (Opinion at 14).

subject matter. For this step, the court concluded that, "the claims simply instruct the practitioner to implement the abstract idea with routine, conventional activity," with no reference to a timeframe for applying this analysis.[20] In addition, the district court found that WMI's patent claims "are not tied to any particular novel machine or apparatus, only a general purpose computer, general communication devices, and general vehicles."[21]

SUMMARY OF THE ARGUMENT

The dismissal of WMI's patent infringement complaints and the invalidation of the claims of its' '789 and '291 Patents for lack of patent-eligible subject matter should be reversed. The district court erred in applying each of the two steps of the *Alice* framework. First, the court wrongly found WMI's claims directed to nothing more than an abstract idea, when the claims cover concrete combinations of physical elements, networked together, to form a real-world solution to a shortcoming in the prior art approach to receiving, tracking, and moving shipping containers. Second, in step two, the court failed to apply the correct timeframe, and conflated § 101 with invalidity under § 102 and § 103, in concluding that the claimed combinations of devices did not amount to an innovative concept. Even if this Court declines to hold WMI's claims patent-eligible, however, it should at least vacate the dismissal and remand for further proceedings because the analysis in this case requires claim construction and the consideration of underlying facts.

[20] JA20 (Opinion at 18).
[21] JA21 (Opinion at 19).

ARGUMENT

I. Standard of Review

The Federal Circuit reviews a dismissal for failure to state a claim under the law of the regional circuit.[22] As in the recent *Contract Extraction* appeal, this matter arose in the Third Circuit, where such decisions under Rule 12(b)(6) are given plenary review.[23] More specifically, "[w]hen a district court dismisses on the basis of an affirmative defense, as is the case here, [the appellate court] will affirm only when the defense is 'apparent on the face of the complaint' and documents relied on in the complaint."[24] Reviewing a Rule 12(b)(6) dismissal, the Third Circuit, "accept[s] all well-pleaded allegations as true, and draw[s] all reasonable inferences in favor of plaintiffs."[25] This Court reviews a ruling invalidating challenged claims under § 101 for lack of patent-eligible subject matter *de novo*.[26]

II. WMI's '789 & '291 Patents Claim Patent-Eligible Subject Matter.

Subject matter-eligibility jurisprudence continues to evolve quickly. The Supreme Court first established the current test in *Mayo.*[27] There, it set forth an analytical framework intended to distinguish patents that add too little to underlying, patent-ineligible laws of nature, natural phenomena, and abstract ideas,

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[22] *In re Bill of Lading Transmission & Processing Sys. Patent Litig.*, 681 F.3d 1323, 1331 (Fed Cir. 2012).
[23] *Content Extraction & Transmission LLC v. Wells Fargo Bank*, 776 F.3d 1343 (Fed. Cir. 2014); *Sands v. McCormick*, 502 F.3d 263, 267 (3d Cir. 2007).
[24] *Bohus v. Restaurant.com, Inc.*, 784 F.3d 918, 923 n.2 (3rd Cir. 2015), citing *Schmidt v. Skolas*, 770 F.3d 241, 249 (3d Cir. 2014).
[25] *In re Adams Golf, Inc.*, 381 F.3d 267, 273 (3d Cir. 2004).
[26] *See Content Extraction*, 776 F.3d at 1357.
[27] *See Mayo Collab. Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012)

from those that claim patent-eligible applications of those concepts.[28] More recently, the Supreme Court in *Alice* reaffirmed that this analysis involves two steps: ***step one***, determining whether the claims at issue are directed to a patent-ineligible abstract idea; and ***step two***, if so, evaluating the elements of each claim—both individually and as an ordered combination—to assess whether the additional elements transform the nature of the claim into a patent-eligible application of that abstract idea.[29] The district court's order in the two cases below relies on this two-step *Alice* framework.

To the extent that courts have invalidated patents under § 101 post-*Alice*, what the invalidated claims generally have in common, starting with the three key Supreme Court decisions on point, is that they preempted methods of doing business, mostly financial transactions, implemented solely on a general purpose computer.[30] Following the Supreme Court's lead, this Court has affirmed the invalidation of broad method claims, including those that add nothing more than a general purpose computer to the method. Most recently, in *OIP Technologies*, the Court agreed that claims drawn to "computer-implemented methods for 'pricing a

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[28] *Mayo Collab. Servs.*, 132 S. Ct. at 1294.
[29] *Alice Corp.*, 134 S. Ct. at 2355.
[30] *See Bilski v. Kappos*, 562 U.S. 593, 598 (2010) (invalidated claims covered "a procedure for instructing buyers and sellers how to protect against the risk of price fluctuations"); *Mayo Collab. Servs.*, at 132 S. Ct. 1296 (invalidated claims covered a law of nature, i.e., "relationships between concentrations of certain metabolites in the blood and likelihood that a dosage of a thiopurine drug will prove ineffective or cause harm"); *Alice*, 134 S. Ct. at 2352 (invalidated claims covered "a computerized scheme for mitigating 'settlement risk'—*i.e.*, the risk that only one party to an agreed-upon financial exchange will satisfy its obligation").

product for sale.'" failed to cover patentability subject matter.[31] In May, a judge of this Court sitting in the Eastern District of Texas invalidated claims covering "a method and system for providing incentive awards programs over a computer network,"[32] and prior to that also invalidated claims "recit[ing] a method enabling a customer to convert loyalty award credits of one vendor into loyalty awards of a second vendor so that the customer can use those converted credits to make purchases from the second vendor."[33] WMI's patent claims at issue here do not fit so neatly into that basket of decisions from the Supreme Court, this Court, and district courts that have invalidated patent claims in reliance on that precedent.

A. WMI's Claims Are Not Directed to a Mere Abstract Idea.

In determining whether a patent claim covers nothing more than an "abstract idea" excluded from patentability, it is important to recall first that section 101 itself affirmatively states what can be patented:

> Whoever invents or discovers any new and useful process, ***machine***, manufacture, or composition of matter, ***or any new and useful improvement thereof***, may obtain a patent therefor, subject to the conditions and requirements of this title.[34]

Subsequent Supreme Court decisions recognized exceptions implicit in section 101—"laws of nature, natural phenomena, and abstract ideas are not

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[31] *See OIP Techs., Inv. v. Amazon.com, Inc.*, 2015 U.S. App. LEXIS 9721 (Fed. Cir., Jun11, 2015).
[32] *See Kroy IP Holdings, LLC v. Safeway, Inc.*, 2015 U.S. Dist. LEXIS 69363 (E.D. Tex. May 29, 2015).
[33] *See Loyalty Conversion Sys. Corp. v. Am. Airlines, Inc.*, 2014 U.S. Dist. LEXIS 122244 (E.D. Tex. Sep. 3, 2014)
[34] 35 U.S.C. § 101 (emphasis added).

patentable"[35]—explaining that, "a new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not patent his celebrated law that $E=mc^2$; nor could Newton have patented the law of gravity."[36] Consistently, however, the Court has cautioned that these exceptions must not be interpreted too broadly to "eviscerate . . . " or "swallow all of patent law. For all inventions ***at some level*** embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas."[37]

Despite recently focusing so heavily on the exclusions that are patent-***in***eligible, the trio of leading Supreme Court opinions did not wipe out the test of whether a claimed invention falls into one of the statutorily patent-***eligible*** categories, including a "machine … or any new and useful improvement thereof."[38] Indeed, the Federal Circuit has reaffirmed post-*Alice* that, "[t]o qualify as a machine under section 101, the claimed invention" need only be "a 'concrete thing, consisting of parts, or of certain devices and combination of devices."[39] WMI's '789 and '291 Patents claim exactly that patent-eligible category of subject matter. The claimed subject matter in this case contrasts with the "improved

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[35] *E.g.*, *Alice*, 134 S. Ct. at 2354.
[36] *Mayo*, 132 S. Ct. at 1293.
[37] *Id.* at 1294 (emphasis added); *Alice*, 134 S. Ct. at 2354 (quoting *Mayo*).
[38] 35 U.S.C. § 101; *see, e.g.*, *Digitech Image Techs., LLC v. Electronics for Imaging, Inc.*, 758 F. 3d 1344, 1348-49 (Fed. Cir. 2014).
[39] *Id.*, *citing Burr v. Duryee*, 68 U.S. 531, 570 (1863); *see also Westinghouse v. Boyden Power Brake Co.*, 170 U.S. 537, 556 (1898) ("A machine is a concrete thing, consisting of parts, or of certain devices and combination of devices. The principle of a machine is properly defined to be its mode of operation, or that peculiar combination of devices which distinguishes it from other machines.").

device profile" that this Court held invalid in *Digitech*. In *Digitech*, this Court concluded that the claims covered only data or information, not in a tangible form; they did not "claim any tangible part of the digital processing system."[40]

The district court quoted '789 Patent claims 1 and 9 and '291 Patent claims 1 and 32 in its decision, and then proclaimed that, "[a]s all the other claims of the Patents are drawn to similar processes, they suffer from the same infirmity as the representative claims and need not be considered further."[41] And for each of those four claims it reproduced, the court made sure it was clear that its analysis was conducted, "[w]ithout purporting to construe the claim(s) . . . ."[42]

Contrary to the district court's approach, the law requires that "[t]he question of [patent] eligible subject matter must be determined on a claim-by-claim basis."[43] For example, "a system claim that builds on the same abstract idea as a patent-ineligible method may well incorporate sufficient additional limitations, computer-based or otherwise, to transform that idea into a patent-eligible application."[44] Although in limited circumstances an extended claim-by-claim analysis may not necessary where multiple claims are "substantially similar and linked to the same abstract idea,"[45] that is not the case here where Appellees in their briefs, and the district court in its opinion, failed to explain how the claims are

[40] *Digitech*, 758 F. 3d at 1349.
[41] JA8 (Opinion at 6), citing *Ultramercial*, 772 F.3d at 712.
[42] JA16-19 (Opinion at 14, 15, 16, 17).
[43] *Ultramercial*, 722 F.3d at 1340.
[44] *Alice*, 717 F.3d at 1291, fn. 4.
[45] *Content Extraction & Transmission LLC v. Wells Fargo Bank*, 776 F.3d 1343, 1358-59 (Fed. Cir. 2014).

substantially similar. Importantly, WMI disputes that all of the ’789 and ’291 claims-at-issue are substantially similar,[46] and presented evidence in its opposition briefing that they are not substantially similar. Because this dispute is factual in nature, Appellant should have prevailed at the pleading stage on the question of whether the claims can be examined together.

At the very least, any patent claim that arguably introduces a “meaningful” limitation—*e.g.*, one that requires a particular machine or particular transformation—should be examined separately.[47] Because each such limitation can amount to something that is “significantly more” under the *Alice* two-step analysis, each should be analyzed before the claim is invalidated.[48] As explained below, analysis of the claims belies the generalizations offered by Appellees, which was erroneously accepted by the district court.

(i) Independent System Claim 1 of the ’789 Patent

Claim 1 of the ’789 Patent is directed to an electronic and mechanical system for receiving, moving, and monitoring shipping containers. It is not limited to the idea of monitoring containers in the abstract, but rather it specifies details of how the monitoring is done, including the use of tangible components in the real world. For example, the claim requires a bounded area with an “entry point”—a

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[46] *See Ultramercial*, 722 F.3d at 1338-1340; *StoneEagle*, 2015 U.S. Dist. LEXIS 15144 at *10-11 (rejecting defendants’ attempt to designate certain “representative” claims in a § 101 motion, and observing that typically, absent a stipulation between the parties as to certain claims being representative, the movant must submit supporting evidence for *each* claim it seeks to destroy).
[47] *See Ultramercial*, 722 F.3d at 1345-1347.
[48] *See Mayo*, 132 S. Ct. at 1293.

physical entity—where the containers are identified by pre-existing identification codes. The claim further requires "switching vehicles." As the written description explains, these switching vehicles may participate in the monitoring of containers.[49] The recitation of these vehicles thus demonstrates that the patents cover monitoring in a concrete, real-world application, not as an abstract idea.[50]

Finally, the last element of the claim arguably includes a means-plus-function term ("means for recording . . . ") governed by 35 U.S.C. § 112. The literal scope of such a term is defined in terms of "corresponding structures" disclosed in the specification and any equivalents. This term thus literally includes all physical structures disclosed in the specification that carry out the recited function (recording information) and reasonable equivalents thereof. The specification includes, for example, structures such as data input terminals at the entry point, as well as the switching vehicles, optical scanners, a mainframe computer hosting a database, and any required network connections.[51] The complete scope of this claim element would require a careful examination of the patent specification and file history, and might also require extrinsic evidence—potentially expert testimony—on what might be considered "equivalent." Therefore, construing the scope and meaning of this claim element would be improper at this stage, but suffice it to say that even the examples from the

[49] JA90 ('789 Patent at 7:23-47).
[50] *See Ultramercial*, 722 F.3d at 1343 ("An abstract idea is one that has no reference to material objects or specific examples—*i.e.*, it is not concrete.").
[51] JA80, JA89-90 ('789 Patent at Fig. 2, 5:2-9, 5:19-32, 7:19-47).

specification cited here are enough to take the claim outside the territory of an abstract idea because it recites a number of concrete, non-generic elements.

Indeed, if claim 1 was nothing more than just an abstract idea, it could not have possibly distinguished the prior art, in which, as the patent admits in its background, rudimentary monitoring of shipping containers was already being practiced. Claim 1 represents an improvement over those existing real-world systems. It is directed to far more than just the idea of monitoring containers.

(ii) Independent System Claim 1 of the '291 Patent

In claim 1 of the '291 Patent, not just one, but every limitation is written in means-plus-function form. As explained above regarding system claim 1 of the '789 patent, these limitations are defined by the corresponding structure disclosed in the specification and equivalents thereof. The specification discloses, for example, means for "recording an identification code" such as data input terminals, code scanners, and RFID tags.[52] The specification also discloses "means for communicating" such as hand-held radios and data transceivers.[53] Beyond that, it additionally discloses means for "generating reports," including a mainframe computer, a database, and a user terminal with a graphical screen.[54] These specially configured "peculiar combination of devices," networked together to solve a

[52] JA69, JA73 ('291 Patent at 5:37-50, 13:19-30).
[53] JA69-70 ('291 Patent at 5:51-55, 7:55-60).
[54] JA34 ('291 Patent at Fig. 2); JA52 ('291 Patent at Fig. 11B); JA69 ('291 Patent at 5:24-37); JA71 ('291 Patent at 9:30-39); JA73 ('291 Patent at 12:43-13:6).

problem in this field, render this claim a patentable application of an idea.[55] Claim 1 of the '291 Patent presents exactly the type of "concrete thing, consisting of parts, or of certain devices and combination of devices." Such subject matter has been long held to be patent eligible under the most basic reading of § 101.[56]

(iii) Independent Method Claim 32 of the '291 Patent

As discussed above in connection with system claim 1 of the '789 Patent, the specification of that patent discloses concrete components to carry out the steps of "identification" and "recording," including data input terminals, code scanners, RFID tags, and a mainframe computer with a database.[57] Although method claim 32 does not recite report generation as a step, the preamble of the claim states that it is a "method of generating a . . . report." Applicable here too, the specification discloses components to carry the "generating" of a report, including a mainframe computer, a database, and a user terminal with a graphical screen.[58]

In addition, claim 32 makes two references to a "switcher," which is a switching vehicle. The first reference in the preamble requires a switching step to

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[55] *See Westinghouse v. Boyden Power Brake Co.*, 170 U.S. 537, 556 (1898) ("A machine is a concrete thing, consisting of parts, or of certain devices and combination of devices. The principle of a machine is properly defined to be its mode of operation, or that peculiar combination of devices which distinguishes it from other machines.").

[56] *Digitech Image Techs*, 758 F. 3d 1344, *citing Burr v. Duryee*, 68 U.S. 531, 570 (1863); *see also Westinghouse v. Boyden Power Brake Co.*, 170 U.S. 537, 556 (1898).

[57] JA69 ('291 Patent at 5:33-51), JA73 ('291 Patent at 13:19-30).

[58] JA34 ('291 Patent at Fig. 2); JA41-44 ('291 Patent at Figs. 7A-7D); JA69-73 ('291 Patent at 5:24-37, 8:35-43, 9:30-39, 10:27-32, 12:43-13:6).

have taken place in the method. The second reference in step (c) requires that step to be carried out by equipment on the switching vehicle. Again, these concrete components render claim 32 patentable, setting forth a specific "mode of operation" that employs the "combination of devices" of the system claims.[59] Again, it is important to understand that the inventive subject matter of this claim lies in these very components. The claim is not directed to just an idea, but a method of operating a specific system to implement an idea. At a minimum, in the absence of any evidence at the pleading stage, Appellant should be granted that interpretation of the claim.

(iv) Independent Method Claim 9 of the '789 Patent

Circling back to the '789 Patent and method claim 9 of that patent, its last three steps recite the actual, physical *moving* of containers. The claim thus covers a method of *moving* containers as well as *monitoring* them before and after they have been moved. This is not a mental process; it cannot be done on pencil and paper, or simply in the circuits of general purpose computer. This does not fit into any of judicial exceptions to § 101—it is not an abstract idea.[60]

Further, as with claim 1 of the '789 Patent, this claim also recites several physical components, making the claim a patentable application of an idea rather than the idea itself. The claim again references, for example, a "point of entry" and

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[59] *Digitech Image Techs.*, 758 F. 3d 1344 *citing Burr v. Duryee*, 68 U.S. 531, 570 (1863); *see also Westinghouse v. Boyden Power Brake Co.*, 170 U.S. 537, 556 (1898).

[60] *See CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1368, fn. 1 (Fed. Cir. 2011) (describing a "mental process" that is not patentable under § 101).

a "switching vehicle." The specification discloses ways of "identifying" containers that require particular hardware equipment such as data input terminals and code scanners.[61] Here, the '789 Patent's specification teaches that "recording" may be accomplished by a mainframe computer with a database, along with networking components.[62] Claim 9 of the '789 Patent also is not directed to an abstract idea.

(v) The Dependent Claims

A dependent patent claim, by definition, incorporates all of the limitations of its parent claims. It then adds claim elements to the parent claim, narrowing the claim. Therefore, if a parent claim contains sufficient concrete elements to be patent-eligible, the dependent claims cannot be abstract. Because independent claims 1 and 9 of the '789 patent and independent claims 1 and 32 of the '291 patent are not abstract, neither are the claims that depend from those four claims.

Even if WMI's independent claims are held invalid, the dependent claims include additional inventive and concrete elements that make them patent-eligible. Claim 3 of the '789 patent adds a communications link between the monitoring system and a customer management information system.[63] Claim 4 alternatively adds a communication link to a carrier management information system.[64] These additions improve the monitoring system by granting system access a yard's customers and carrier partners, as described in column 5 and 6.[65] These additional

[61] JA89 ('789 Patent at 5:13-32).
[62] JA89 ('789 Patent at 5:33-51).
[63] JA91 ('789 Patent at 10:3-8).
[64] JA91 ('789 Patent at 10:9-14).
[65] JA89 ('789 Patent at 5:33 to 6:44). JA89

physical extensions of the claimed combination of devices enable greater real-time interactivity, to solve the problems identified by inventor.

Claim 8 of the ’789 patent recites that the switching vehicle can be outfitted with a mobile telecommunications means to allow container movements to be communicated to the monitoring system. This improvement allows container movement data to be communicated instantaneously, without human intervention. Claim 18 of the ’789 patent recites that the racks within the containers can also be monitored. This tracking of racks allows the yard operator to obtain more detailed data concerning the state of inventory in the yard, and as a result enables the operator to make better planning decisions.

In the ’291 Patent, claim 2 recites producing a dock availability report from the monitored data, which allows the operator to see which docks are available;[66] while claim 3 recites producing a carrier dock activity report from the monitored data, which allows the operator to see carrier traffic through the yard;[67] and, claim 6 recites producing an arrival count report from the monitored data, which allows the operator to see the number of containers arriving at the yard during a specified time period.[68] All of this sets forth real-time functionality made possible by the networked combination of computers and other devices that make up the invention.

[66] JA41, JA43 (’291 Patent at Figs. 7A, 7C).
[67] JA42 (’291 Patent at Fig. 7B).
[68] JA45-46 (’291 Patent at Figs. 8A, 8B).

B. WMI's Claims Set Forth a Patentable Innovative Concept.

Even if this Court disagrees with WMI on step one, the dismissal for failure to state a claim nevertheless must be set aside because, under step two of the *Alice* analysis, the claims set forth an "innovative concept." The combination of elements in the claims in question "transforms" the claimed subject matter into something "significantly more than" a patent on the ineligible concept itself.[69] Here the district court wrongly concluded that "the limitations of the '291 and the '789 patents do not transform the abstract idea they recite into patent-eligible subject matter because the claims simply instruct the practitioner to implement the abstract idea with routine, conventional activity,"[70] The decision should be reversed.

Without question, the Supreme Court for over forty years has emphasized that the inventive concept to save an otherwise patent-ineligible claim cannot be supplied merely by carrying it out with a "purely conventional" general purpose computer.[71] In *Benson*, an algorithm did not become patentable when "carried out in existing computers long in use," and "implemented on 'a general-purpose digital computer."[72] In *Flook*, a computerized method for using a mathematical formula was not patentable when "the computer implementation was purely conventional."[73] Indeed, the *Mayo* opinion incants no less than three times that it

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[69] *See Mayo*, 132 S. Ct. at 1297; *Ultramercial*, 772 F.3d at 715.
[70] JA20 (Opinion at 18).
[71] *See Alice*, 134 S. Ct. at 2354-58 (summarizing the Supreme Court's precedent regarding section 101 of the Patent Act).
[72] *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972); *see Alice*, 134 S. Ct. at 2357.
[73] *Parker v. Flook*, 437 U.S. 584 (1978)

is not enough to add nothing "other than what is well-understood, routine, conventional activity, previously engaged in by [those] in the field."[74]

This Court agrees, holding in *Ultramercial* that "the claims simply instruct the practitioner to implement the abstract idea with routine, conventional activity."[75] A month later in *Content Extraction*, this Court held that using only a conventional scanner and generic computer combination "well-known at the time of filing," to implement "the abstract idea of 1) collecting data, 2) recognizing certain data within the collected data set, and 3) storing that recognized data in memory," was not sufficient to save the claims.[76] In contrast, WMI's claims relate to a far more-substantial combination of interconnected devices working together.

The district court here committed reversible error in at least three ways, in attempting to apply step two of the *Alice* framework. First, it neglected to evaluate the patentability of this real world combination of electronic and mechanical equipment as of the time of filing for the patents-in-suit, an issue of fact; second, it incorrectly conflated patentability under § 101 with validity under § 102 and § 103; and finally, it failed to consider the concrete, physical combination of devices the system is comprised of, and the claimed methods require, as a combination.

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[74] *Mayo*, 132 S. Ct. at 1294, 1298, 1299.
[75] *Ultramercial*, 772 F.3d at 715.
[76] *Content Extraction*, 776 F.3d at 1358 (the Court observed that, "humans have always performed these functions.").

1. The District Court Failed to Evaluate the Factual Context of the Invention at the Time of Filing, as Required.

In holding that all of WMI's patent claims also failed the second step of Alice, the court below parroted the language of *Ultramercial*, that the claims simply tell one to apply the abstract idea with "routine, conventional" activity. What the district court overlooked is what was stressed in *Content Extraction*, that what is routine, conventional, or generic must be judged "at the time of filing," not in the present. In that opinion, the Court stressed that the patentee "conceded at oral argument that the use of a scanner or other digitizing device to extract data from a document was well-known *at the time of filing*," in holding the claims patent-ineligible.[77] Older decisions of this Court likewise have pointed out that "the word 'conventional' necessarily has a meaning specific to the time of filing."[78]

The decision below makes absolutely no mention whatsoever of the temporal context being applied in the district court's analysis. Nowhere does the dismissal opinion address the state of the art "at the time of filing," much less explain how the combination of devices claimed in WMI's systems claims, or applied by the method claims, was entirely routine and conventional ***at the time of filing***. For this reason alone, the decision below should be reversed. In the alternative, at the very least the decision below should be vacated for the case to

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[77] *Content Extraction*, 776 F.3d at 1348.

[78] *PC Connector Solutions LLC v. Smartdisk Corp*., 406 F.3d 1359, 1363-64 (Fed. Cir. 2005); *see Univ. of Utah Research Found. v. Ambry Genetics Corp. (In re BRCA1- & BRCA2- Based Hereditary Cancer Test Patent Litig.)*, 774 F.3d 755, 764 (Fed. Cir. 2014) (finding in *Alice* step 2 that non-ineligible claim element, "set forth well-understood, routine and conventional activity engaged in by scientists at the time of Myriad's patent applications.").

proceed on remand in developing the underlying facts (as well claim construction disputes) to enable full consideration of the patent-eligibility issue.

2. The Court Wrongly Conflated § 101 with § 102 & § 103.

Not only did it neglect to consider the appropriate time frame, but the opinion suggests that the standard the district court applied to determine conventionality asked whether or not individual components of WMI's claimed system, standing alone, were themselves **novel**: "The claims of the '789 and '291 patents, however, ***are not tied to any particularly novel machine or apparatus***, only a general purpose computer, general communication devices, and general vehicles."[79] It is incontrovertible black-letter law that even a combination of old elements can be patentable—this Court from its inception has dismissed that question, simply of whether the elements are old, as "irrelevant":

> That all elements of an invention may have been old (the normal situation), or some old and some new, or all new, is, however, simply irrelevant. Virtually all inventions are combinations of old elements.[80]

From there, the real inquiry should have become whether or not the claimed combination was non-obvious, under § 103, a defense normally fleshed out later in the course of litigation. In effect, the district court conflated § 101 with invalidity

[79] JA21 (Opinion at 19 (emphasis added)).
[80] *See, e.g., Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698 (Fed. Cir. 1983) .

under § 102 and § 103, and deprived WMI of its day in court, and its presumption of validity,[81] to defend its patent claims fully.

3. The District Court Erred in not Considering the Elements of the Claims as a Combination.

Finally, with regard to step two of the *Alice* framework, compounding the two other errors just discussed, the district court wrongly failed to evaluate the claimed combination as a whole, irrespective of whether individual elements were known at any particular time, to determine whether it transformed WMI's claims into patentable subject matter. A judge of this Court, sitting by designation in the Eastern District of Texas, summed up the analysis well in upholding the validity the challenged claims in the *TQP Development* case. After examining the usual litany of post-*Alice* cases invalidating patent claims, that court explained,

> "[i]n most of those cases a computer was used to perform steps that are commonly performed without a computer, such as hedging, effecting routine insurance transactions, or selecting an appropriate treatment regimen for a medical patient. This case, however, involves a way of making computer communication itself more effective by making that communication more secure. Thus, although the invention in this case does not result in the physical transformation of matter of the sort involved, for example, in *Diamond v. Diehr*, 450 U.S. 175 (1981) (method for curing rubber), it involves a specific

[81] While there may be debate presently about whether or not the presumption of validity applies to an invalidity challenge under § 101, no one denies that it still applies to § 102 and § 103. Thus trying to shoehorn a § 103 challenge into § 101, and at the pleading-stage of litigation, as Appellees have done here, is in part an extra bite at the apple for defendants to circumvent the normal development of contentions with the clear and convincing burden of proof that should apply.

> system for modifying data that has equally concrete and valuable effects in the field of electronic communications.[82]

In this case, the claimed combinations of hardware, software, mechanical, and communications components similarly add up together to inventive concepts that improve an existing technological process. For example, in each of the asserted independent claims, the adding of a data input terminal to a switching vehicle allows the yard operator to improve upon its operations by enabling the tracking of container locations in real time.[83] Likewise, the use of code scanners and RFID tags allows the tracking to take place effortlessly. Further, using a mainframe computer and a centralized database, information and the container locations and load status can be kept consistent and openly accessible to anyone at the yard.[84] Finally, for the claims of the '291 Patent, the addition of user terminals and their various reporting capabilities makes possible a variety of functionality that were not available before, including the ability to detect process inefficiencies, facilitate billing, and plan yard activities.[85]

In essence, the WMI Patents integrate the concept of real-time monitoring to conventional yard management operations by adding a combination of physical equipment and real-world process steps, not mere mental exercises. These

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[82] *TQP Developments, LLC v. Intuit, Inc.*, No. 2:12-CV-180-WCB, Order, Feb. 19, 2014 (J. Bryson sitting by designation). JA651-JA665

[83] JA87 ('789 patent at 1:45-49 (describing the difficulty in the state of the art of locating shipped goods without a real-time tracking system)).

[84] JA87 ('789 Patent at 1:40-45 (explaining that in the state of the art, the location of goods is not generally known within an organization)).

[85] JA87, JA89-90 ('789 Patent at 2:20-40, 2:41-51, 5:48-51, 7:49-8:2, 8:3-42, 8:43-64, 8:65-9:7).

cumulative additions collectively implement a new real-time container monitoring system for a container yard, improving upon existing technological processes, and producing concrete and valuable effects in this industry. WMI's patent claims therefore represent patentable subject matter, and the judgment should be reversed.

CONCLUSION & STATEMENT OF RELIEF SOUGHT

For the foregoing reasons, WMI respectfully requests that this Court vacate the judgement below, reverse the dismissal, hold that the asserted claims of the '291 and '789 Patents are dedicated to patent-eligible subject matter, and remand for further proceedings consistent with that determination. In the alternative, WMI asks that the Court at least reverse the dismissal for failure to state a claim, under F. R. Civ. P. 12(b)(6), and remand with instructions that the ruling on § 101 at the pleadings stage was premature, absent further development of the legal and factual issues raised by WMI's complaints, and Appellees' presumptive defenses.

Dated: 17 July 2015

Respectfully submitted,

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ADDENDUM

TABLE OF CONTENTS

UNITED STATES DISTRICT COURT
DISTRICT OF NEW JERSEY

WIRELESS MEDIA INNOVATIONS, LLC Plaintiff, v. MAHER TERMINALS, LLC Defendants. WIRELESS MEDIA INNOVATIONS, LLC Plaintiff, v. GLOBAL TERMINAL & CONTAINER SERVICES, LLC.	Civil Action No. 14-7004; 14-7006 (JLL) **ORDER**

LINARES, District Judge.

This matter comes before the Court by way of TWO motions to dismiss Plaintiff Wireless Media Innovations, LLC ("Plaintiff")'s Complaints in two separate actions against Defendant Maher Terminals, LLC ("Maher") and Defendant Global Terminal & Container Services, LLC ("Global")(Collectively "Defendants") under Federal Rule of Civil Procedure 12(b)(6). (CM/ECF No. 14; No. 14). No oral argument was heard pursuant to Federal Rule of Civil Procedure 78. The Court has considered the submissions and arguments made in support of and in opposition to the instant motions, and for the reasons set forth in its corresponding Opinion;

It is on this 20th day of April, 2015

ORDERED that because the '789 and '291 patent claims are directed to no more than a patent-ineligible abstract idea, Defendants' motions to dismiss (CM/ECF No. 14; No. 14) are **GRANTED;** Plaintiff's Complaints are dismissed with prejudice.

IT IS SO ORDERED.

/s/Jose L. Linares
Jose L. Linares
Unites States District Judge

UNITED STATES DISTRICT COURT
DISTRICT OF NEW JERSEY

WIRELESS MEDIA INNOVATIONS, LLC Plaintiff, v. MAHER TERMINALS, LLC Defendants. WIRELESS MEDIA INNOVATIONS, LLC Plaintiff, v. GLOBAL TERMINAL & CONTAINER SERVICES, LLC.	Civil Action No. 14-7004; 14-7006 (JLL) **OPINION**

LINARES, District Judge.

This matter comes before the Court by way of TWO motions to dismiss Plaintiff Wireless Media Innovations, LLC ("Plaintiff")'s Complaints in two separate actions against Defendant Maher Terminals, LLC ("Maher") and Defendant Global Terminal & Container Services, LLC ("Global")(Collectively "Defendants") under Federal Rule of Civil Procedure 12(b)(6). (CM/ECF No. 14; No. 14). No oral argument was heard pursuant to Federal Rule of Civil Procedure 78. The Court has considered the submissions and arguments made in support of and in opposition to the instant motions. For the reasons set forth below, Defendants' motions are **GRANTED.**

I. BACKGROUND

Plaintiff is a limited liability company organized under the laws of Delaware. (Maher Comp. at ¶¶ 1-2). Plaintiff is the owner of two patents covering certain systems and methods relating to the monitoring of shipping containers. (*Id.* at ¶¶ 7-9). The Patents are U.S. Patent Number 6,148,291 (" '291 Patent") and U.S. Patent 5,712,789 (" '789 Patent"). Maher is a limited liability corporation organized under the laws of Delaware, with its principle place of business in New Jersey. (*Id.* at ¶ 2). Global is a limited liability corporation organized under the laws of Delaware, with its principle place of business in New Jersey, as well. (Global Comp. at ¶ 2). In nearly identical Complaints, Plaintiff alleges that Defendants operate at least one terminal operating system and operative methods associated therewith to monitor the locations and load statuses of containers at Defendants' respective terminals. (Maher and Global Comp. at ¶ 11). Plaintiff alleges that by monitoring the containers, Defendants infringed and continue to infringe on one or more claims of Plaintiff's '291 Patent and Plaintiff's '789 Patent. (*Id.* at ¶ 12). Plaintiff has pled one count of infringement for each of its two Patents, against each Defendant, respectively. (*Id.* at ¶¶ 10-17).

Defendants filed two separate motions to dismiss asserting that Plaintiff's Patents are ineligible for patent protection under 35 U.S.C. § 101 because they are directed at an abstract idea. The principal issues are whether the Court can assess invalidity under § 101 before formal claim construction, and, if so, whether the Patents are, in fact, ineligible for patent protection according to the abstractness test articulated in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S.Ct. 2347 (2014).

II. LEGAL STANDARD

For a complaint to survive dismissal, it "must contain sufficient factual matter, accepted as true, to 'state a claim to relief that is plausible on its face.'" *Ashcroft v. Iqbal*, 556 U.S. 662,

678 (2009) (citing *Bell Atl. Corp. v. Twombly*, 550 U.S. 544, 570 (2007)). "Threadbare recitals of the elements of a cause of action, supported by mere conclusory statements, do not suffice." *Id.* In determining the sufficiency of a complaint, the Court must accept all well-pleaded factual allegations in the complaint as true and draw all reasonable inferences in favor of the non-moving party. *See Phillips v. County of Allegheny*, 515 F.3d 224, 234 (3d Cir. 2008). But, "the tenet that a court must accept as true all of the allegations contained in a complaint is inapplicable to legal conclusions." *Iqbal*, 556 U.S. at 678. Thus, legal conclusions draped in the guise of factual allegations may not benefit from the presumption of truthfulness. *Id.*; *In re Nice Sys., Ltd. Sec. Litig.*, 135 F. Supp. 2d 551, 565 (D.N.J. 2001).

III. DISCUSSION

A. Motions Before the Court

1. Defendants' Motions

Defendants contend that dismissal of Plaintiff's Complaints is warranted on the following grounds: (1) The question of Patent eligibility under 35 U.S.C.§ 101 can and should be decided at the Pleading stage on a motion to dismiss; (2) In view of *Bilski, Mayo,* and *Alice*, the '789 and '291 Patents claim ineligible subject matter; and (3) in the alternative, Plaintiff's Complaints should be dismissed under Fed. R. Civ. P. 12(b)(6) for failing to comply with *Twombly* and *Iqbal.*

2. Plaintiff's Opposition

Plaintiff rebuts Defendants' arguments on the following grounds: (1) Defendants' motions are premature; (2) The Patents in suit claim patent-eligible subject matter; and (3) Plaintiff's Complaints satisfy the pleading standard.

B. The Patents

The '789 Patent entitled "CONTAINER MONITORING SYSTEM AND METHOD", was filed on August 28, 1995 and was issued on January 27, 1998. The abstract to the '789 patent states:

> A container monitoring system and method tracks location and load status of shipping containers within a defined premises and generates container status reports for customers receiving containers, suppliers or shippers of goods, and container carriers. Carrier and container identifiers are used to track and monitor movements and status of each container from a point of departure to a final destination and return. A combined computer and telecommunications system is also disclosed for executing the tasks of the container monitoring system.

The '291 Patent entitled "CONTAINER AND INVENTORY MONITORING METHODS AND SYSTEMS", was filed on January 26, 1998 and was issued on November 14, 2000. The application for the '291 patent was "related to" the '888 application, on which the '789 Patent was granted. The abstract to the '291 patent states:

> Container and inventory monitoring methods and systems provide detailed logistical control of containers, shipping racks and resident and in-transit inventory. The methods and systems create and maintain accurate real-time records of the location, movement and load status of containers, racks and inventory within the facility boundaries and between facilities such as factories, assembly plants, warehouses, shipping yards and freight switching facilities. Detailed data on container switching, unloading and loading activity is recorded and archived. A virtual inventory accounting is provided by tracking from customer release orders to supplier shipments and rack returns.

The following claims are representative of the patents and read as follows:

Claim 1 of the '789 patent recites:

> 1. A container monitoring system for accumulating and storing information on shipping containers including container location and container load status, the system comprising:

a receiving area for receiving containers to be monitored by the system, said receiving area within a defined boundary within which containers are to be monitored by the system,

a container entry point at the boundary at which containers are identified by pre-existing identification codes which are recorded at the container entry point,

a switching vehicle for moving containers to and from a receiving area and to and from a facility within the boundary according to instructions received from the facility, and

means for recording information on locations and load status of containers within the defined boundary.

('789 patent at 9:47-65.)

Claim 9 of the '789 patent recites:

9. A method for monitoring location and load status of shipping containers comprising the steps of:

identifying carriers and containers by identification codes at a point of entry to a facility,

recording identification codes of containers to be monitored,

moving a container from the point of entry to a receiving area and recording the location of the container within the receiving area,

moving a container from a receiving area via a switching vehicle to a final destination according to instructions received from the facility and recording the location of the final destination of the container,

moving the container from the final destination to a receiving area and recording the receiving area location of the container and the status of a load in the container.

('789 patent at 10:30-45.)

Claim 1 of the '291 patent recites:

1. A computerized system for monitoring and recording location and load status of shipping containers relative to a facility with an associated yard defined by a

> boundary within which containers are to be monitored by the system, and a controlled entry point to the boundary, the system comprising:
>
> means for recording identification codes of containers which enter the boundary,
>
> means for communicating and recording information on movements, location and load status of containers within the boundary in response to movement and changes in location and load status of containers made according to instructions received from the facility,
>
> means for generating reports of recorded information on locations and load status of containers within the boundary, and
>
> means for generating reports on container locations and load status relative to designated docks associated with a facility.

('291 patent at 18:40-59.)

Claim 32 of the '291 patent recites:

> 32. A method of generating a live unload exception report for monitoring containers intended to be unloaded at a dock of a facility upon arrival at the facility without being first placed in a yard associated with the facility, but which were switched at least once before arriving at a dock, the method comprising the steps of:
>
> (a) identifying live unload containers from information received by an advance shipping notice,
>
> (b) recording a date and time of arrival of an identified live unload container,
>
> (c) recording a date and time of contact with the live unload container by a switcher which flags the container as a live unload exception, and
>
> (d) recording a total number of switches of the container before the container arrives at a dock.

('291 patent at 20:52-67.) As the other claims of the Patents are drawn to similar processes, they suffer from the same infirmity as the representative claims and need not be considered further. *Ultramercial, Inc. v. Hulu,* LLC, 772 F.3d 709, 712 (Fed. Cir. 2014). (Hereinafter "*Ultramercial*

II"). The Federal Circuit has held that an extended claim by claim analysis is not necessary where multiple claims are "substantially similar and linked to the same abstract idea." *See Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n, 776 F.3d 1343, 1348 (Fed. Cir. 2014); Bilski v. Kappos, U.S. 130 S.Ct. 3218, 3225, 177 L.Ed.2d 792 (2010),* (determining that eleven (11) claims in a patent application were invalidly abstract after only analyzing two (2) of the claims in detail); *CyberFone Sys., LLC v. Cellco P'ship, 885 F.Supp.2d 710, 715 (D.Del.2012)* (invalidating all twenty-four (24) claims of a patent for abstractness after only conducting an analysis of the first claim*); and Glory Licensing LLC*, 2011 WL 1870591 (dismissing three (3) patents containing 121 claims after analyzing only a single claim of a single patent in detail). The "basic character of the claimed subject matter" in dispute in this action is clearly evident to the Court and no further construction of the claims is required.

C. Patent Eligibility at the Pleading Stage

Courts may properly decide the question of patent eligibility at the pleading stage and without first construing the claim terms. "[C]laim construction is not an inviolable prerequisite to a validity determination under § 101." *Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Canada* (U.S.), 687 F.3d 1266, 1273. (Fed.Cir.2012). Where appropriate, district courts have adjudicated subject matter eligibility before claim construction. *See, e.g., See Bilski*, U.S., 130 S.Ct. 3218, 177 L.Ed.2d 792*; CyberFone,* 885 F.Supp.2d at 715*; Glory Licensing LLC v. Toys R Us, Inc.,* No. 09–4252(FSH), 2011 WL 1870591 (D.N.J. May 16, 2011)*, appeal dismissed,* 459 F. App'x 916 (Fed.Cir.2011); *DietGoal Innovations LLC v. Bravo Media LLC*, Civ. 13-8391, F.Supp.2d, 2014 WL 3582914, at *16 (S.D.N.Y. July 8, 2014) ("the computerized process disclosed in the '516 Patent is invalid under § 101, under any reasonable construction. Claim construction would not assist the Court in resolving the § 101 claim of invalidity"); *Sinclair–Allison, Inc. v. Fifth*

Ave. Physician Servs., LLC, Civ. 12–360–M, 2012 WL 6629561, at *2 (W.D.Okla. Dec. 19, 2012), aff'd, 530 F. App'x 939 (Fed.Cir.2013) ("there is no requirement that claims construction be completed before examining patentability"). Plaintiff admits that the Court may decide this issue at the pleadings stage. *See* Plaintiff's sur-reply at 4, n.1 ("WMI does not dispute that the Court *has the power* to rule on this issue at this early stage is not in dispute [sic]; the issue at hand is whether it is *appropriate* to do so.")

Courts have indeed dismissed patent suits on the pleadings because the patents were ineligible under § 101. *See, e.g., Lumen View Tech. LLC v. Findthebest.com, Inc.*, 984 F.Supp.2d 189, 205 (S.D.N.Y.2013) (granting judgment on the pleadings because "[t]he claimed process elements of Claim 1 are straightforward. No components are opaque such that claim construction would be necessary to flush out its contours"); *Cardpool, Inc. v. Plastic Jungle, Inc.*, Civ. 12–04182, 2013 WL 245026, *3 (N.D.Cal. Jan. 22, 2013) ("[t]here is no authority for the proposition that a patent may not be deemed ineligible subject matter on a motion to dismiss"); *OIP Technologies, Inc.i v. Amazon.com, Inc.*, C–12–1233, 2012 WL 3985118, at *5 (N.D.Cal. Sept. 11, 2012) ("the procedural posture of this case does not render Amazon's [12(b)(6)] motion premature").

Patentability is a question of law "that may be informed by subsidiary factual issues." *CyberFone* 885 F.Supp.2d 710, 715 (D.Del.2012) (*citing In re Comiskey*, 554 F.3d 967, 976 (Fed.Cir.2009)). There are no disputed facts that need to be resolved to decide this issue, which is question of law. Although Plaintiff states that at least some claim construction is required, even if the Court construes all claim terms in a manner most favorable to Plaintiff, it would still find that none of the claims survive §101.

D. Defendant's Burden

"A patent shall be presumed valid .... The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity." 35 U.S.C. § 282(a). Plaintiff argues that Defendants must prove subject matter ineligibility using a "clear and convincing" standard, relying on *Ultramercial, Inc. v. Hulu,* LLC, 722 F.3d 1335, 1342 (Fed. Cir. 2013) cert. granted, judgment vacated sub nom. ("Ultramercial I"). Defendants then properly identified that *Ultramercial*, has since been vacated by the Supreme Court, and the Federal Circuit's majority did not re-address this standard. However, in his concurring opinion Judge Mayer stated:

> The rationale for the presumption of validity is that the United States Patent and Trademark Office ("PTO"), "in its expertise, has approved the claim." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 426, 127 S.Ct. 1727, 167 L.Ed.2d 705 (2007). That rationale, however, is "much diminished" in situations in which the PTO has not properly considered an issue. *Id.* Because the PTO has for many years applied an insufficiently rigorous subject matter eligibility standard, no presumption of eligibility should attach when assessing whether claims meet the demands of section 101.
>
> ***
>
> Although the Supreme Court has taken up several section 101 cases in recent years, it has never mentioned—much less applied—any presumption of eligibility. The reasonable inference, therefore, is that while a presumption of validity attaches in many contexts, *see Microsoft Corp. v. i4i Ltd. P'ship*, U.S. 131 S.Ct. 2238, 2243–47, 180 L.Ed.2d 131 (2011), no equivalent presumption of eligibility applies in the section 101 calculus.

Ultramercia II, F.3d 709, 720-21 (Fed. Cir. 2014). With no authoritative law binding the Court as to an applicable standard, the Court adopts Judge Mayer's approach and will not afford Plaintiff's Patents the presumption of subject matter eligibility.

While the patent may be presumed valid as required by 35 U.S.C. § 282(a), its subject matter will not be afforded a presumption of eligibility at this stage of the litigation. The Court is cognizant that "claim construction is not an inviolable prerequisite to a validity determination

under § 101" but "will ordinarily be desirable—and often necessary—to resolve claim construction disputes prior to a § 101 analysis, for the determination of patent eligibility requires a full understanding of the basic character of the claimed subject matter." *Bancorp Servs., L.L.C.* (U.S.), 687 F.3d 1273–74. However, for the Court to apply a "clear and convincing" standard as to subject matter eligibility at the motion to dismiss stage, the Court would effectively create a near impossible threshold for a defendant to clear when assessing a patent's subject matter under the test articulated by *Alice*. Judge Mayer noted, "[f]rom a practical perspective, addressing section 101 at the outset of litigation will… conserve scarce judicial resources," as well as, provide a deterrent "against vexatious infringement suits." *Ultramercial II* at 719. By imposing a "clear and convincing" standard, the practical effects of addressing section 101 at the outset of litigation would be defeated by a Plaintiff who merely asserts that the court should differentiate any claim in the patent at issue from a representative claim proposed by the Defendant. "Failure to recite statutory subject matter is the sort of "basic deficiency," that can, and should, "be exposed at the point of minimum expenditure of time and money by the parties and the court[.]" *Id.* (*citing Bell Atl. Corp. v. Twombly,* 550 U.S. 544, 558, 127 S.Ct. 1955, 167 L.Ed.2d 929 (2007)). With that legal framework at hand, the Court now turns its analysis to Plaintiff's patents under the purview of *Alice* and *Mayo*.

E. §101

Section § 101 states: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title." The statute is to be given a "wide scope." *Bilski,* U.S. 130 S.Ct. 3218, 3225, 177 L.Ed.2d 792 (2010) (*quoting Diamond v. Chakrabarty,* 447 U.S. 303, 308, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980)).

The Supreme Court has delineated three exceptions to Section 101's "broad patent-eligibility principles: 'laws of nature, physical phenomena, and abstract ideas.' " *Id.* (*quoting Chakrabarty,* 447 U.S. at 309).

The abstract-idea exception precludes patents that "would pre-empt use of [a particular] approach in all fields, and would effectively grant a monopoly over an abstract idea." *Bilski,* 130 S.Ct. 3218, 3231 (2010). For example, "[a] mathematical formula as such is not accorded the protection of our patent laws, and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." *Diamond v. Diehr,* 450 U.S. 175, 184, 101 S. Ct. 1048, 1055, 67 L. Ed. 2d 155 (1981) (citations omitted). "Similarly, insignificant post-solution activity will not transform an unpatentable principle into a patentable process." *Id.* at 191–92. "[M]ethods which can be performed mentally, or which are the equivalent of human mental work, are unpatentable abstract ideas ...." *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1371 (Fed.Cir.2011). By contrast, "an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Diehr*, 450 U.S. at 1057. (emphasis in original).

The Supreme Court most recently examined the abstract-idea exception in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S.Ct. 2347 (2014), particularly as that exception applies to computer-implemented schemes, and clarified the test that courts must apply. The Supreme Court identified a two-part analysis for distinguishing patents that claim abstract ideas from those that claim patent-eligible applications of abstract ideas. In *Alice*, the Supreme Court identified a "framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Id.* at 2355 (*citing Mayo*, 132 S.Ct. at 1296–97). "First, we determine whether the claims at issue are

directed to one of those patent-ineligible concepts." *Id.* If not, the claims pass muster under § 101. Then, in the second step, if we determine that the claims at issue are directed to one of those patent-ineligible concepts, we must determine whether the claims contain "an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.' " *Id.* (*quoting Mayo,* 132 S.Ct. at 1294)

Defendants argue that Plaintiff's patents are, on their face, invalid as a matter of law under 35 U.S.C. § 101. Defendants move to dismiss Plaintiff's Complaints because, Defendants contend, the Patents Plaintiff is asserting against Defendants are directed to abstract ideas, which are ineligible for protection under Section 101. Defendants contend that the subject matter of the '789 patent and the '291 patents represent precisely the kind of abstract ideas to which §101, along with the relevant case law, apply to ensure that such ideas remain in the public domain. Defendants state that the claims within the patents themselves are linked to the same underlying abstract idea: monitoring locations, movements, and load status of shipping containers within a container receiving yard, and storing, reporting and communicating this information in various forms. Defendants stress that the claims are limited to general steps and means for recording information that could be carried out by human memory, by hand, or by general purpose computer and printing resources.

Defendants point out that in Claims 9 to 19 of the '789 Patent and Claims 21 to 35 of the '291 Parent, the claims include no field of use limitations requiring the use of a computer or device at all. Defendants assert that the subject matter of the claims could be performed with wholly human skill and human memory or by the use of a pencil and paper. Defendants argue

that the claims in Plaintiff's patents are anticipatory of vast areas of ordinary shipping, container monitoring, and information management that have long been part of the public domain.

Moreover, Defendants state that Plaintiff's patents do not include any additional features that qualify as "inventive concepts" sufficient to "transform the claim abstract idea into a patent eligible application." Defendants note that although several of the claims recite specific elements that implement the abstract idea, they point out that elements that merely require generic computer implementation and provide no additional, inventive, transformative concept are not sufficient to confer patent eligibility.

Plaintiff responds to Defendants' arguments by stating that it would be premature for the Court to invalidate Plaintiff's patent at the pleading stage. Plaintiff cites case law for the proposition that dismissals for lack of eligible subject matter should be the exception, not the rule. Plaintiff states that claim construction may be necessary for the Court to invalidate the patents, and the accompanying material to conduct proper claim construction is not before the Court at this time. Plaintiff argues that the Patents-in-suit arguably include several "means-plus function" claims, which requires the Court to study the Patent's specification and prosecution history. Plaintiff asserts that this is a necessary exercise before deciding the present §101 issue.

Plaintiff argues that while Defendants ask the Court to rule that every single claim of each patent is invalid, Defendants do not provide analysis for each claim for the Court to consider. Instead, Plaintiff contends, Defendants summarily conclude that the "claims are substantially similar" but offer no explanation of how they are purportedly similar, beyond referencing Defendants' misleading chart titled, "description of coverage" of the claims. Plaintiff argues that Defendant's attempt to generalize the patents and failure to consider each and every claim is a failure to meet their burden of clear and convincing proof. Moreover, Plaintiff asserts

that the method claims in the patents are not simply mental processes, but rather that plausible constructions exist which show that steps in the Patents' claims require machines.

We agree with Defendants that claims of the '789 and the '291 Patents are directed to the same abstract idea: monitoring locations, movement, and load status of shipping containers within a container-receiving yard, and storing, reporting and communicating this information in various forms through generic computer functions. Plaintiff's arguments that the patent claims are not abstract because they require physical steps and include the use of tangible components is beside the point; the claims merely recite the abstract idea of monitoring the location and load status of containers in a yard. *See Alice*, 134. S. Ct. 2347, 2358 (2014) ("The fact that a computer necessarily exist[s] in the physical, rather than purely conceptual, realm…is beside the point.")

We first examine the claims because the claims are the definition of what a patent is intended to cover. An examination of the claim limitations of the '789 patent show that claim 1 includes a system for monitoring shipping containers. Without purporting to construe the claim, the claim recites the bounds of the area in which the containers are monitored, recorded and the means by which they are moved. Plaintiff argues that claim 1 is not limited to the idea of monitoring containers in the abstract, but rather it specifies details of how the monitoring is done, including the use of tangible components. Plaintiff further points to the use a physical "entry point" and the use of "switching vehicles" reflect that the monitoring takes place in a concrete, real world application, not as an abstract idea. Moreover, Plaintiff states that the claim arguably contains a means-plus-function term ("means for recording") which includes all physical structures used to carry out the function of recording information, such as data input terminals at the entry point, switching vehicles, optical scanners, a mainframe computer hosting

a database, and any required network connections. Despite Plaintiff's contentions, the *Alice* court stated:

> There is no dispute that a computer is a tangible system (in § 101 terms, a "machine"), or that many computer-implemented claims are formally addressed to patent-eligible subject matter. But if that were the end of the § 101 inquiry, an applicant could claim any principle of the physical or social sciences by reciting a computer system configured to implement the relevant concept. Such a result would make the determination of patent eligibility "depend simply on the draftsman's art," *Flook*, supra, at 593, 98 S.Ct. 2522, thereby eviscerating the rule that " '[l]aws of nature, natural phenomena, and abstract ideas are not patentable,' " *Myriad*, 569 U.S. 133 S.Ct., at 2116.

Alice at 2358-59. Although Plaintiff is correct that claim incorporates tangible components into the monitoring system, this is not enough for the system to become patent-eligible subject matter. *See Ultramercial II* 772 F.3d 709, 715 (Fed. Cir. 2014) ("Although certain additional limitations, such as consulting an activity log, add a degree of particularity, the concept embodied by the majority of the limitations describes only [an] abstract idea...") Despite Plaintiff's contentions, Claim 1 articulates nothing more than the process of monitoring, recording, sorting, communicating, and generating information regarding shipping containers in a shipping yard. These are all abstract ideas themselves.

A further examination of the '789 patent shows that claim 9 includes 5 steps for monitoring the location and load status of shipping containers. Without purporting to construe the claims, the steps include: (1) identifying the carriers and containers by an ID code; (2) recording the ID code of the monitored container; (3) moving and recording the movement of the container from a storage area to a receiving area; (4) moving the container from the receiving area to a vehicle to the final destination and recording the relevant information; and (5) moving the container from the final destination to receiving area and recording the relevant information. ('789 patent at 10:30-45.)

This ordered combination of steps recites an abstraction—an idea, having no particular concrete or tangible form; the process of monitoring and moving shipping containers and collecting the relevant data as to the location of the shipping containers. Plaintiff argues that because this claim covers a method of "moving" containers, as well "monitoring" them before they have to be moved, this does not constitute a mental process and does not fit into any of the judicial exceptions to §101. However, the Federal circuit has articulated that the mere presence of a physical step to collect data will not render a claim patent eligible. *In re Grams*, 888 F.2d 835, 840 (Fed. Cir. 1989); *Bilski*, 561 U.S. 593, 611 (2010). Here, Claim 9 is reflecting nothing more that the abstract process of monitoring and moving shipping containers and collecting the relevant data as to the location of the shipping containers.

An examination of the claim limitations of the '291 patent shows that claim 1 includes a computerized system for monitoring and recording location and load status of shipping containers relative to a facility. Without purporting to construe the claim, the claim recites that the system comprises the means for recording the identification codes of the containers, communicating the movements of the containers, and generating reports of the recorded information regarding the containers. While Plaintiff argues that the claim is not abstract because it includes the use of tangible components, the Court has already noted that an abstract idea is not rendered patentable just because of connections to the physical world. *Alice*, 134 S. Ct. at 2358. It is apparent to the Court that this claim is limited to general steps and means for monitoring, recording, sorting, communicating and generating location and load status information, which could be carried out by human memory, by hand, or by conventional equipment and general purpose computer and printer resources. *CyberSource,* 654 F.3d at 1372.

Finally, a further examination of the '291 patent shows that claim 32 includes steps for generating a report for monitoring containers to be unloaded without first being placed in a yard at the container facility. Without purporting to construe the claims, the steps include: (1) identifying the containers to be unloaded; (2) recording the date and time of the arrival of the container; (3) recording the date and time of contact with a switching vehicle; and (4) recording the total number of times a container has been switched before arriving at the dock. ('291 patent at 20:52-67.)

This ordered combination of steps recites an abstraction—an idea, having no particular concrete or tangible form; the process of inputting data in a computer for the purpose of generating a report regarding container without first being placed in a yard at the container facility. As previously noted, while Plaintiff argues that the claim is not abstract because it includes the use of tangible components, such as a mainframe computer, the Court has already noted that an abstract idea is not rendered patentable just because of connections to the physical world. *Alice*, 134 S. Ct. at 2358. Moreover, the Federal circuit has articulated that the mere presence of a physical step, such as inputting information into a computer, to collect data, will not render a claim patent eligible. *In re Grams*, 888 F.2d 835, 840 (Fed. Cir. 1989); *Bilski*, 561 U.S. 593, 611 (2010). Here, Claim 32 recites nothing more than the abstract process of inputting data in a computer for the purpose of generating a report regarding container without first being placed in a yard at the container facility.

The second step in the analysis requires us to determine whether the claims do significantly more than simply describe that abstract method. *Mayo*, 132 S.Ct. at 1297. We must examine the limitations of the claims to determine whether the claims contain an "inventive concept" to "transform" the claimed abstract idea into patent-eligible subject matter. *Alice*, 134

S.Ct. at 2357 (*quoting Mayo,* 132 S.Ct. at 1294, 1298). The transformation of an abstract idea into patent-eligible subject matter "requires more than simply stat[ing] the [abstract idea] while adding the words 'apply it.' " *Id.* (*quoting Mayo*, 132 S.Ct. at 1294) (alterations in original). "A claim that recites an abstract idea must include 'additional features' to ensure 'that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].' " *Id.* (*quoting Mayo,* 132 S.Ct. at 1297) (alterations in original). Those "additional features" must be more than "well-understood, routine, conventional activity." *Mayo,* 132 S.Ct. at 1298.

We conclude that the limitations of the '291 and the '789 patents do not transform the abstract idea they recite into patent-eligible subject matter because the claims simply instruct the practitioner to implement the abstract idea with routine, conventional activity. *Ultramercial II* at 715. None of the 5 steps in claim 9 of the '789 patent or the 4 steps in claim 32 of the '291 patent, viewed "both individually and 'as an ordered combination,' " transform the nature of the claim into patent-eligible subject matter. *See Alice*, 134 S.Ct. at 2355 (*quoting Mayo*, 132 S.Ct. at 1297, 1298). The majority of these steps comprise the abstract ideas of the process of monitoring and moving shipping containers and collecting the relevant data as to the location of the shipping containers, and the process of inputting data in a computer for the purpose of generating a report regarding container without first being placed in a yard at the container facility, respectively. Adding routine steps of recording, identifying, and communicating the ID code of a particular container, or moving the container from the receiving area to a vehicle does not transform an otherwise abstract idea into patent-eligible subject matter. Instead, the claimed sequence of steps comprises only "conventional steps, specified at a high level of generality," which is insufficient to supply an "inventive concept." *Id.* at 2357 (*quoting Mayo*, 132 S.Ct. at 1294, 1297, 1300). Indeed, the steps of monitoring, recording, and inputting information represent insignificant

"data-gathering steps," *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1370 (Fed.Cir.2011), and thus add nothing of practical significance to the underlying abstract idea.

The claims' invocation of a computer also adds no inventive concept. While the Supreme Court has held that the machine-or-transformation test is not the sole test governing § 101 analyses, *Bilski*, 561 U.S. at 604, 130 S.Ct. 3218, that test can provide a "useful clue" in the second step of the *Alice* framework, *see Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Can.*, 687 F.3d 1266, 1278 (Fed.Cir.2012) (holding that the machine-or-transformation test remains an important clue in determining whether some inventions are processes under § 101), cert. denied, 573 U.S. ——, 134 S.Ct. 2870, 189 L.Ed.2d 832 (2014). A claimed process can be patent-eligible under § 101 if: "(1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing." *In re Bilski*, 545 F.3d 943, 954 (Fed.Cir.2008) (en banc), aff'd on other grounds, *Bilski*, 561 U.S. 593, 130 S.Ct. 3218.

The claims of the '789 and '291 patents, however, are not tied to any particular novel machine or apparatus, only a general purpose computer, general communication devices, and general vehicles. As the Supreme Court has previously held, adding a computer to otherwise conventional steps does not make an invention patent-eligible. *Alice*, 134 S.Ct. at 2357. Any transformation from the use of computers or the transfer of content between computers is merely what computers do and does not change the analysis. Moreover, storing and querying information in a database based upon that information, is one of the most basic function of a database system. *Id.* at 2359. ("[E]lectronic recordkeeping" is "one of the most basic functions of a computer.") Although several claims recite specific system elements, these elements merely require generic computer functions that are not inventive.

The claims of the '789 and '291 patents also fail to satisfy the transformation prong of the machine-or-transformation test. The methods as claimed refer to a system for monitoring shipping containers and a computerized system for monitoring and recording location and load status of shipping containers relative to a facility. These ordered steps for recording and inputting relevant information as to shipping containers cannot meet the test because they are not physical objects or substances, and they are not representative of physical objects or substances." *Bilski*, 545 F.3d at 963. Nowhere does the patents tie the claims to a novel machine. We therefore hold that the claims of the '789 and '291 patents do not transform any article to a different state or thing. While this test is not conclusive, it is a further reason why the claims of the '789 and '291 patents do not contain anything more than conventional steps relating to monitoring, recording and inputting relevant information as to shipping containers at a container facility. Therefore, the Court holds that the '789 and '291 patens do not cover patent-eligible subject matter. [1]

IV. CONCLUSION

Because the '789 and '291 patent claims are directed to no more than a patent-ineligible abstract idea, we **GRANT** Defendant Maher Terminals, LLC and Defendant Global Terminal & Container Services, LLC's motions to dismiss.

An appropriate order accompanies this Opinion.

[1] In the alternative, the Court would most likely find that Plaintiff's Complaints satisfy the *Twombly* and *Iqbal* pleading standard. The fact that Plaintiff filed nearly identical complaints in other districts against other parties does not necessarily mean these Complaints fail to comply with *Iqbal* and *Twombly*. Plaintiff's Complaints sufficiently identify the accused product. Plaintiff is not required to identify the accused product by trade name; rather, identification of the product category is sufficient. Defendants' motions seek to dismiss Plaintiff's indirect infringement claims in its Complaints, but Plaintiff does not allege indirect infringement claims in its Complaints, (though they reserved their right in the future). Even if the Court finds that Plaintiff's Complaints are deficient, it would most likely grant Plaintiff leave to amend.

Date: April 20, 2015

Jose L. Linares
Unites States District Judge

US006148291A

United States Patent [19]

Radican

[11] Patent Number: 6,148,291

[45] Date of Patent: Nov. 14, 2000

[54] **CONTAINER AND INVENTORY MONITORING METHODS AND SYSTEMS**

[75] Inventor: **Joseph E. Radican**, Rocky River, Ohio

[73] Assignee: **K & T of Lorain, Ltd.**

[21] Appl. No.: **09/013,392**

[22] Filed: **Jan. 26, 1998**

[51] **Int. Cl.**[7] **G06F 17/60**; G06F 17/00; B07C 3/18

[52] **U.S. Cl.** **705/28**; 705/29; 705/22

[58] **Field of Search** 705/22, 28, 29

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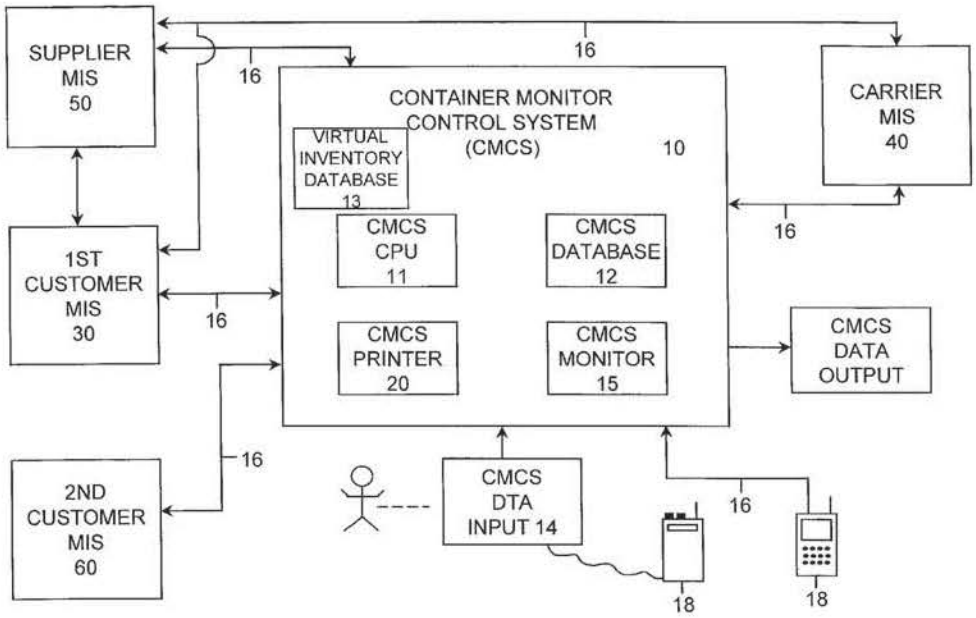
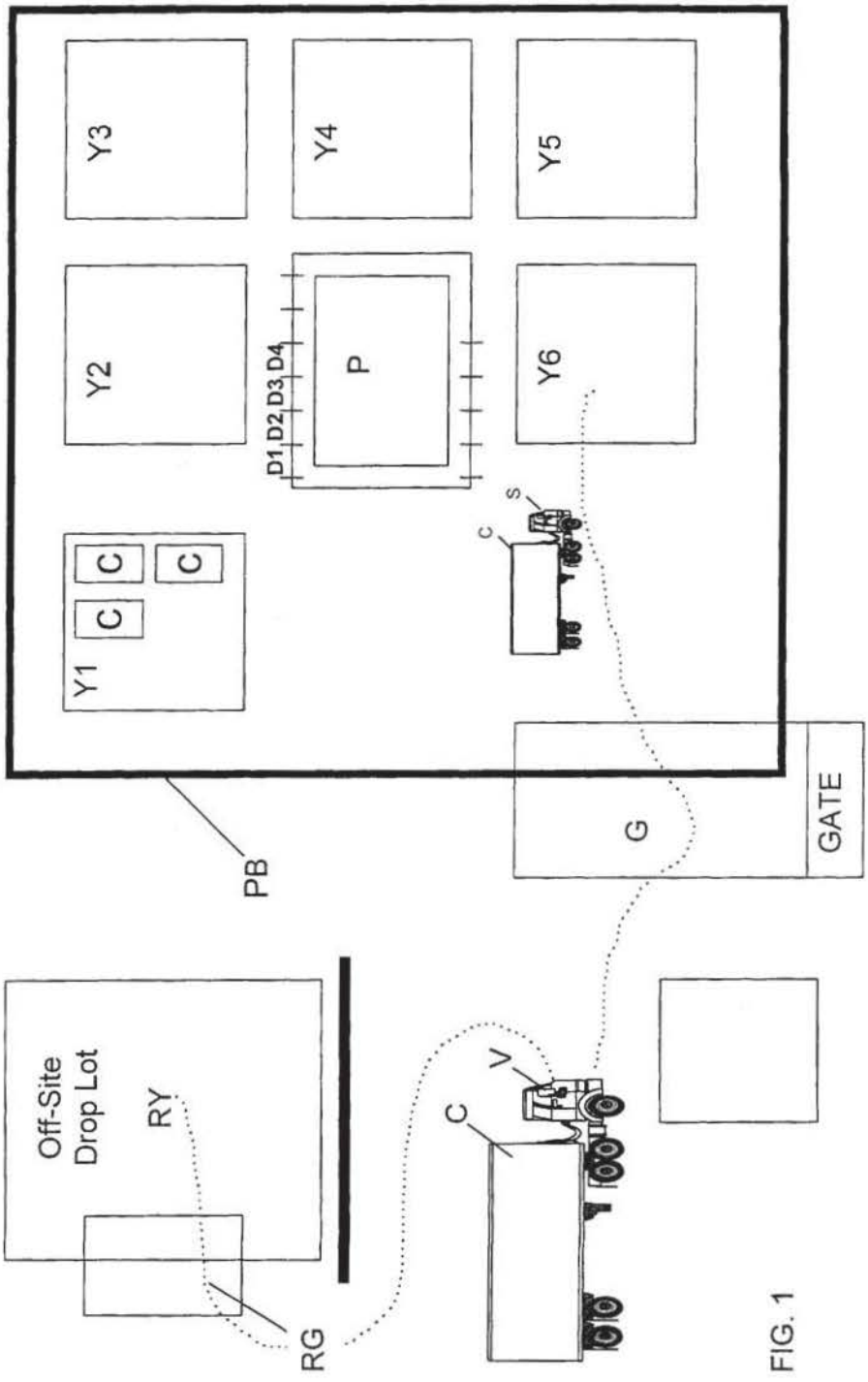
Primary Examiner—Tod R. Swann
Assistant Examiner—James W. Myhre
Attorney, Agent, or Firm—Arter & Hadden LLP

[57] **ABSTRACT**

Container and inventory monitoring methods and systems provide detailed logistical control of containers, shipping racks and resident and in-transit inventory. The methods and systems create and maintain accurate real-time records of the location, movement and load status of containers, racks and inventory within the facility boundaries and between facilities such as factories, assembly plants, warehouses, shipping yards and freight switching facilities. Detailed data on container switching, unloading and loading activity is recorded and archived. A virtual inventory accounting is provided by tracking from customer release orders to supplier shipments and rack returns.

35 Claims, 34 Drawing Sheets

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D1 D2 D3 D4
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C
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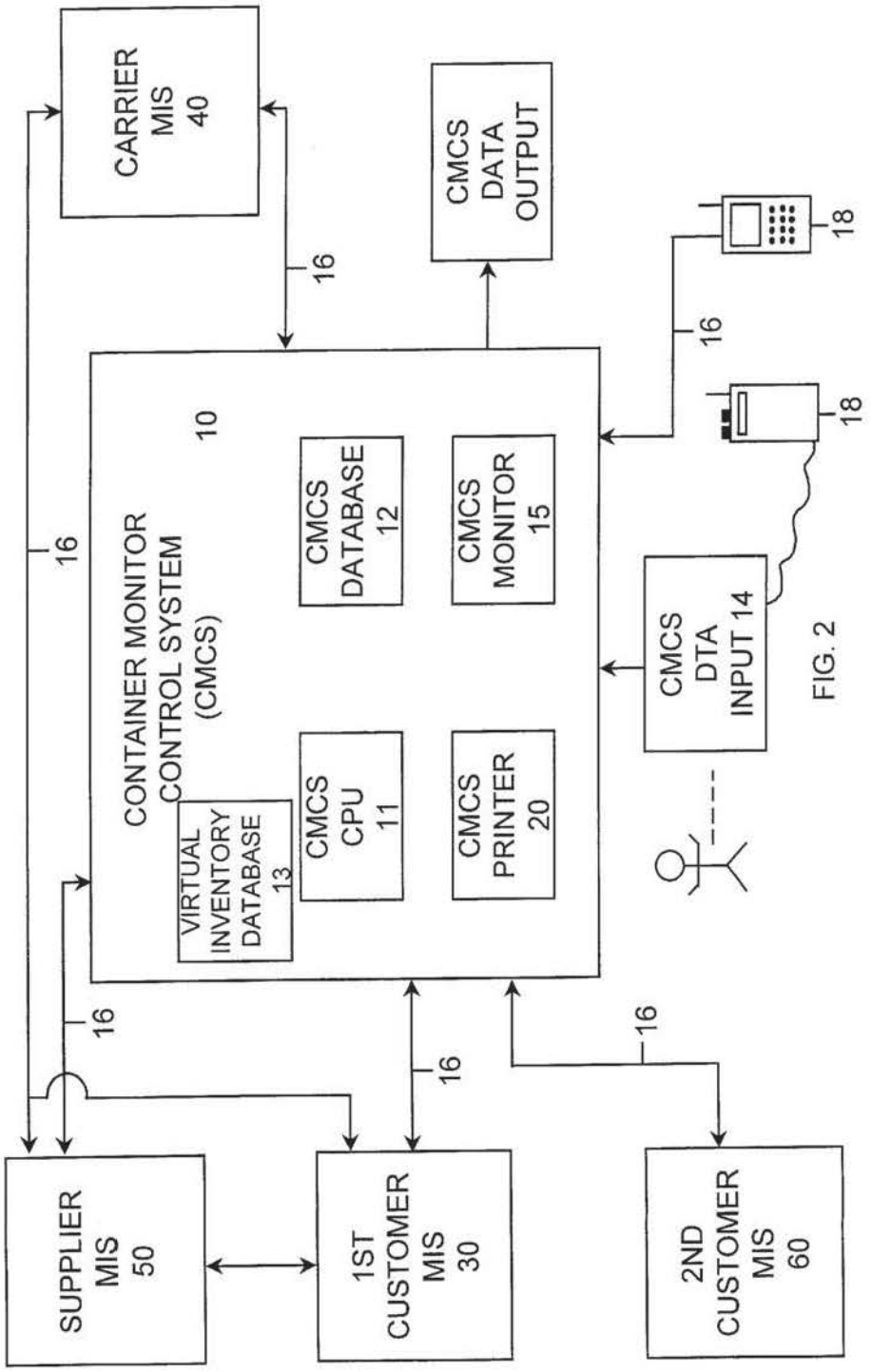
FIG. 1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CONTAINER MONITOR CONTROL SYSTEM (CMCS)
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VIRTUAL INVENTORY DATABASE 13
CMCS CPU 11
CMCS PRINTER 20
CMCS DTA INPUT 14
SUPPLIER MIS 50
1ST CUSTOMER MIS 30
2ND CUSTOMER MIS 60

FIG. 2

100

DETAIL ON HAND

CARRIER	CARRIER NAME	DATE	TIME	DOCK	YARD	STATUS	TRAILER	PACKING LIST
ADXR	A.D. TRANSPORT	06/26/95	09:39		N	EMPTY	16504	
ADXR	A.D. TRANSPORT	06/26/95	08:46		N	EMPTY	92018	
ADXR	A.D. TRANSPORT	06/22/95	13:21		N	TRUCK LOAD	92020	
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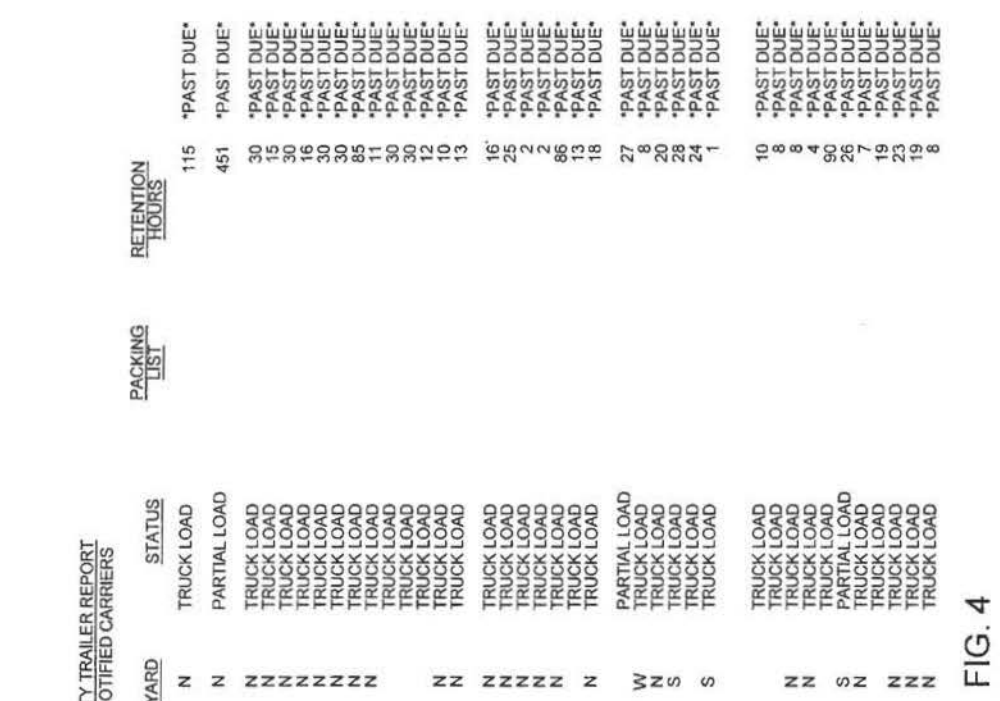
FIG. 3


120
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STATUS
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BGTH BIG THREE EXPEDITERS 482417 N PARTIAL LOAD 451 *PAST DUE*
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1946 N TRUCK LOAD 16 *PAST DUE*
1949 N TRUCK LOAD 30 *PAST DUE*
1951 N TRUCK LOAD 30 *PAST DUE*
1952 N TRUCK LOAD 85 *PAST DUE*
1955 N TRUCK LOAD 11 *PAST DUE*
5309 38 TRUCK LOAD 30 *PAST DUE*
5318 37 TRUCK LOAD 30 *PAST DUE*
5325 32 TRUCK LOAD 12 *PAST DUE*
5332 N TRUCK LOAD 10 *PAST DUE*
700 N TRUCK LOAD 13 *PAST DUE*
CIEG CIMARRON EXPRESS 48383 N TRUCK LOAD 16 *PAST DUE*
485903 N TRUCK LOAD 25 *PAST DUE*
534611 N TRUCK LOAD 2 *PAST DUE*
538355 N TRUCK LOAD 2 *PAST DUE*
851589 N TRUCK LOAD 86 *PAST DUE*
851659 56 N TRUCK LOAD 13 *PAST DUE*
851765 N TRUCK LOAD 18 *PAST DUE*
CRBR CREECH BROTHERS 53151 62 PARTIAL LOAD 27 *PAST DUE*
5321 W TRUCK LOAD 8 *PAST DUE*
53211 N TRUCK LOAD 20 *PAST DUE*
53260 S TRUCK LOAD 28 *PAST DUE*
53281 22 TRUCK LOAD 24 *PAST DUE*
53331 S TRUCK LOAD 1 *PAST DUE*
CUIT CUSTOMIZED TRANSPORTATION INC. 0519 3 TRUCK LOAD 10 *PAST DUE*
0520 59 TRUCK LOAD 8 *PAST DUE*
0522 N TRUCK LOAD 8 *PAST DUE*
0541 N TRUCK LOAD 4 *PAST DUE*
0547 18 TRUCK LOAD 90 *PAST DUE*
0562 S PARTIAL LOAD 26 *PAST DUE*
0603 N TRUCK LOAD 7 *PAST DUE*
100138 20 TRUCK LOAD 19 *PAST DUE*
100154 N TRUCK LOAD 23 *PAST DUE*
100242 N TRUCK LOAD 19 *PAST DUE*
100281 N TRUCK LOAD 8 *PAST DUE*

FIG. 4

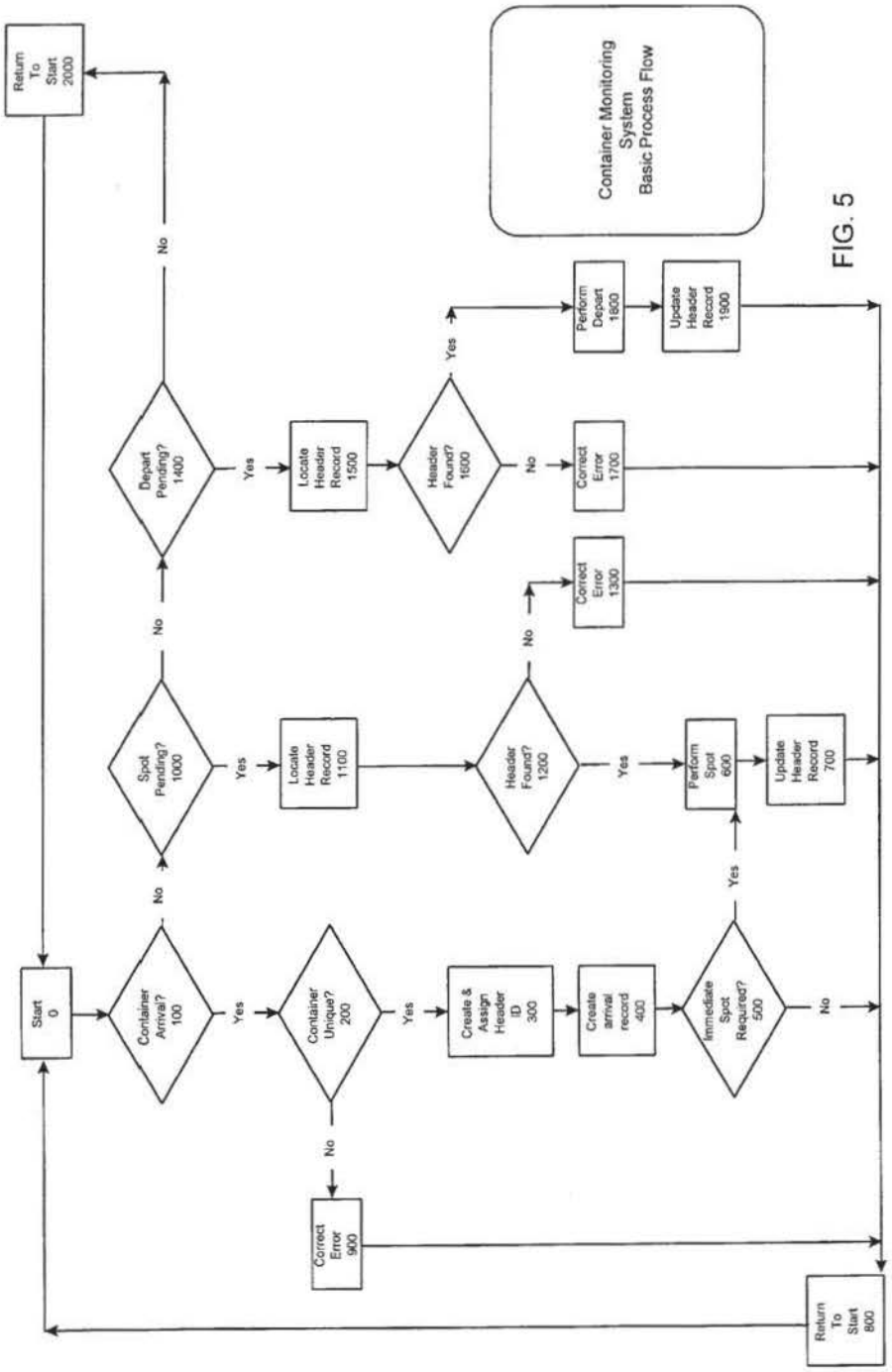
Container Monitoring System Basic Process Flow
Start 0
Container Arrival? 100
Container Unique? 200
Create & Assign Header ID 300
Create arrival record 400
Immediate Spot Required? 500
Perform Spot 600
Update Header Record 700
Spot Pending? 1000
Locate Header Record 1100
Header Found? 1200
Correct Error 1300
Depart Pending? 1400
Locate Header Record 1500
Header Found? 1600
Correct Error 1700
Perform Depart 1800
Update Header Record 1900
Correct Error 900
Return To Start 800
Return To Start 2000
Yes
No

FIG. 5

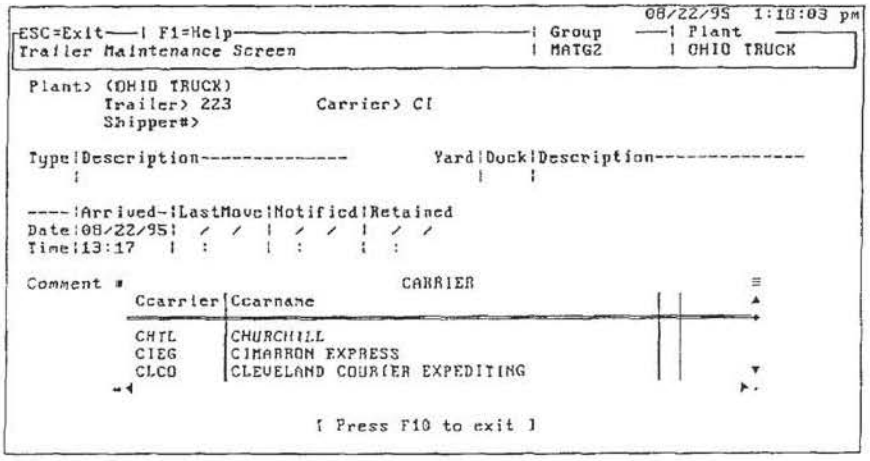
08/22/95 1:18:03 pm
ESC=Exit F1=Help
Trailer Maintenance Screen
Group
MATG2
Plant
OHIO TRUCK
Plant> (OHIO TRUCK)
Trailer> 223
Carrier> CI
Shipper#>
Type
Description
Yard
Dock
Description
Arrived
LastMove
Notified
Retained
Date 08/22/95
Time 13:17
Comment #
CARRIER
Ccarrier
Ccarname
CHTL
CHURCHILL
CIEG
CIMARRON EXPRESS
CLCO
CLEVELAND COURIER EXPEDITING
[Press F10 to exit]

FIGURE 6A

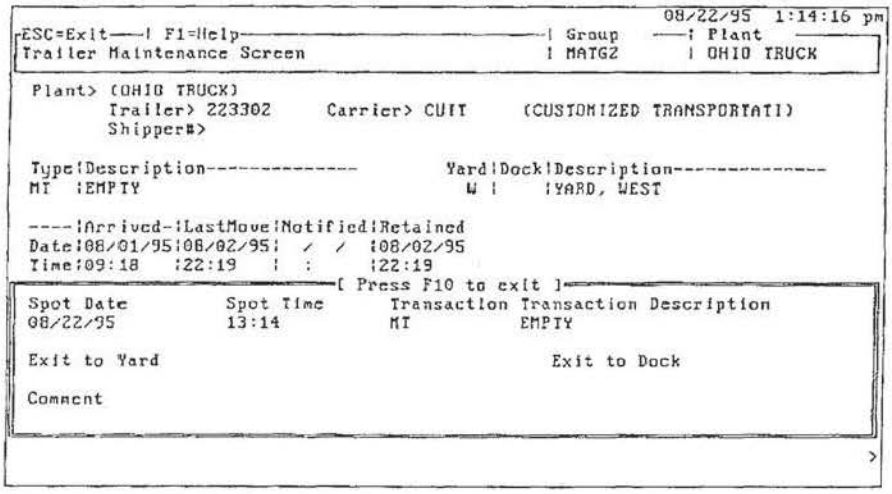
08/22/95 1:14:16 pm
ESC=Exit
F1=Help
Group
MATGZ
Plant
OHIO TRUCK
Trailer Maintenance Screen
Plant> (OHIO TRUCK)
Trailer> 223302
Carrier> CUIT
(CUSTOMIZED TRANSPORTATI)
Shipper#>
Type
Description
Yard
Dock
Description
MT
EMPTY
W
YARD, WEST
Arrived
LastMove
Notified
Retained
Date
08/01/95
08/02/95
08/02/95
Time
09:18
22:19
22:19
[Press F10 to exit]
Spot Date
Spot Time
Transaction
Transaction Description
08/22/95
13:14
MT
EMPTY
Exit to Yard
Exit to Dock
Comment

FIGURE 6B

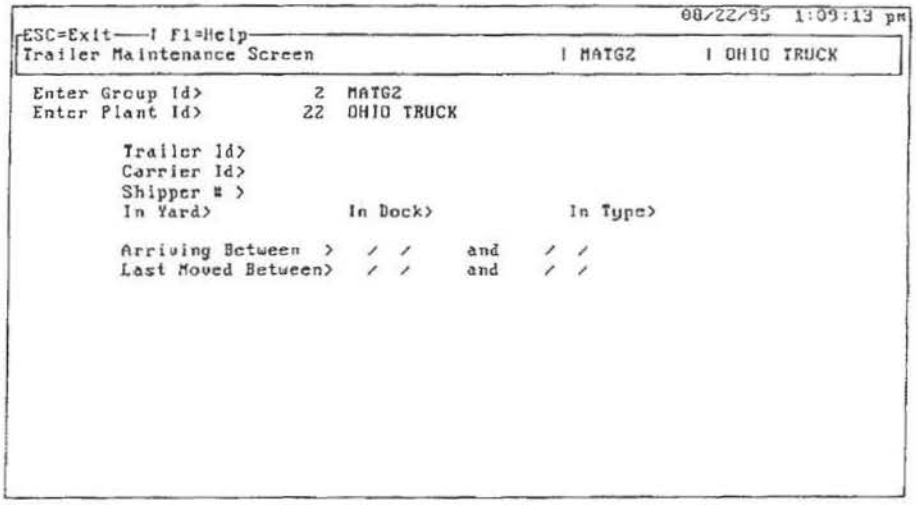
08/22/95 1:09:13 pm
ESC=Exit—! F1=Help
Trailer Maintenance Screen
! MATG2
! OHIO TRUCK
Enter Group Id> 2 MATG2
Enter Plant Id> 22 OHIO TRUCK
Trailer Id>
Carrier Id>
Shipper # >
In Yard>
In Dock>
In Type>
Arriving Between > / / and / /
Last Moved Between> / / and / /

FIGURE 6C

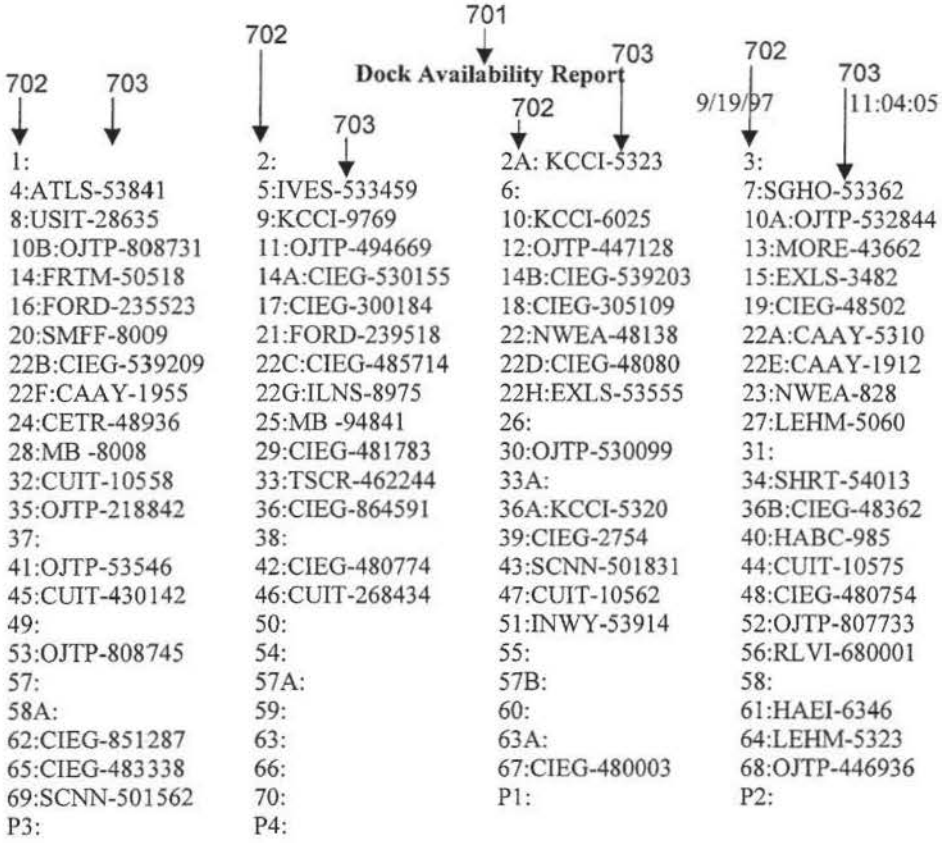
701
Dock Availability Report
702
703
702
703
702
703
9/19/97
11:04:05
1:
2:
2A: KCCI-5323
3:
4:ATLS-53841
5:IVES-533459
6:
7:SGHO-53362
8:USIT-28635
9:KCCI-9769
10:KCCI-6025
10A:OJTP-532844
10B:OJTP-808731
11:OJTP-494669
12:OJTP-447128
13:MORE-43662
14:FRTM-50518
14A:CIEG-530155
14B:CIEG-539203
15:EXLS-3482
16:FORD-235523
17:CIEG-300184
18:CIEG-305109
19:CIEG-48502
20:SMFF-8009
21:FORD-239518
22:NWEA-48138
22A:CAAY-5310
22B:CIEG-539209
22C:CIEG-485714
22D:CIEG-48080
22E:CAAY-1912
22F:CAAY-1955
22G:ILNS-8975
22H:EXLS-53555
23:NWEA-828
24:CETR-48936
25:MB -94841
26:
27:LEHM-5060
28:MB -8008
29:CIEG-481783
30:OJTP-530099
31:
32:CUIT-10558
33:TSCR-462244
33A:
34:SHRT-54013
35:OJTP-218842
36:CIEG-864591
36A:KCCI-5320
36B:CIEG-48362
37:
38:
39:CIEG-2754
40:HABC-985
41:OJTP-53546
42:CIEG-480774
43:SCNN-501831
44:CUIT-10575
45:CUIT-430142
46:CUIT-268434
47:CUIT-10562
48:CIEG-480754
49:
50:
51:INWY-53914
52:OJTP-807733
53:OJTP-808745
54:
55:
56:RLVI-680001
57:
57A:
57B:
58:
58A:
59:
60:
61:HAEI-6346
62:CIEG-851287
63:
63A:
64:LEHM-5323
65:CIEG-483338
66:
67:CIEG-480003
68:OJTP-446936
69:SCNN-501562
70:
P1:
P2:
P3:
P4:

FIG. 7A

710

CARRIER
DOCK ACTIVITY REPORT

CARRIERS=LEHM — 711
DOCKS=
Report Covers:12/04/97 @ 00:00:00 thru 12/04/97 @ 23:59:59 — 712

Inbound from Yard Activity=	17	713
Inbound from Dock Activity=	2	
Arrive directly to Dock =	2	
Total=	21	

Outbound to Yard Activity =	18	714
Outbound to Dock Activity =	1	
Departed from Dock =	0	
Still in Dock =	2	
Total=	21	

Outbound from dock as a Partial Load =	1	715
Outbound from dock as an Empty Load =	3	
Outbound from dock as a Rack Load =	14	
Outbound from dock as any other Status=	1	
Still in Dock =	2	
Total=	21	

Yard-Dock-Yard Switches =	15	716
Yard-Dock-Dock Switches =	1	
Dock-Dock-Dock Switches =	0	
Dock-Dock-Yard Switches =	2	

FIG. 7B

DOCK ACTIVITY REPORT Page: 1

720

CARRIERS=LEHM
DOCKS=
Report Covers:12/04/97 @ 00:00:00 thru 12/04/97 @ 23:59:59

DOCK: 59 — 721

722 In Dock Time	723 Exit Dock Time	724 Dwell Time (minutes)	725 Trailer	726 Carrier
12/04/97 01:09	12/04/97 07:00	351.00	5062	LEHM
727 Inbound Status =TL		From: Yard=LCL	Dock=	
Outbound Status=RO		To: Yard= R2	Dock=	
12/04/97 07:00	12/04/97 08:22	82.00	5060	LEHM
Inbound Status =TL		From: Yard=LCL	Dock=	
Outbound Status=RO		To: Yard= R2	Dock=	
12/04/97 08:22	12/04/97 09:38	76.00	5076	LEHM
Inbound Status =TL		From: Yard= UN	Dock=	
Outbound Status=RO		To: Yard= R1	Dock=	
12/04/97 09:38	12/04/97 11:09	91.00	5062	LEHM
Inbound Status =TL		From: Yard= UN	Dock=	
Outbound Status=RO		To: Yard= R2	Dock=	
12/04/97 11:10	12/04/97 13:17	127.00	5054	LEHM
Inbound Status =TL		From: Yard= UN	Dock=	
Outbound Status=RO		To: Yard= R1	Dock=	
12/04/97 12:59	12/04/97 16:24	205.00	5062	LEHM
Inbound Status =LUT		From: Yard=	Dock=	
Outbound Status=RO		To: Yard= R3	Dock=	
12/04/97 16:25	12/04/97 17:25	60.00	5060	LEHM
Inbound Status =TL		From: Yard= UN	Dock=	
Outbound Status=RO		To: Yard= R3	Dock=	

728

Dock Activity = 7

FIG. 7C

730 LIVE UNLOAD REPORT

CARRIERS=LEHM
DOCKS=
Report Covers:12/04/97 @ 00:00:00 thru 12/04/97 @ 23:59:59

DOCK:LUD — 731

732 In Dock Time	733 Exit Dock Time	734 Dwell Time (minutes)	735 Trailer	736 Carrier
12/04/97 16:38	/ /	0.00	5054	LEHM
Inbound Status =LU		From: Yard=	Dock=	
Outbound Status=		To: Yard=	Dock=	

Dock Activity = 1

FIG. 7D

ARRIVAL COUNT REPORT

Report covers the dates: 11/01/1997 thru 11/30/1997 - 30 day(s)
Report includes the following carriers: ALL

801

1. Detailed Listing by Hour of Day

802 803

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
11/01/97 (SAT)	2	0	0	0	1	0	0	1	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	8
11/02/97 (SUN)	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	3
11/03/97 (MON)	0	1	4	3	4	11	38	7	8	10	10	7	12	14	6	10	12	8	6	10	7	8	8	8	212
11/04/97 (TUE)	7	2	2	1	6	6	8	7	8	7	10	10	14	11	9	8	8	8	9	4	7	9	9	5	175
11/05/97 (WED)	6	3	2	0	3	9	12	9	7	16	5	11	16	11	9	9	9	8	7	8	13	5	5	7	190
11/06/97 (THU)	4	4	2	1	8	8	9	9	7	11	7	14	8	10	11	5	7	6	11	6	7	6	5	5	171
11/07/97 (FRI)	6	5	3	4	7	13	11	7	8	9	8	16	11	8	4	7	12	8	5	4	8	5	5	4	178
11/08/97 (SAT)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11/09/97 (SUN)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
11/10/97 (MON)	0	1	0	0	5	21	36	9	10	8	7	15	10	7	9	10	9	8	10	7	6	9	8	4	209
11/11/97 (TUE)	5	2	1	1	2	14	5	8	5	11	10	7	13	11	8	3	13	5	8	10	5	7	11	5	170
11/12/97 (WED)	7	6	0	2	2	18	7	10	7	5	13	9	14	13	9	5	11	6	7	9	7	2	7	12	188
11/13/97 (THU)	6	4	3	2	3	14	6	8	5	3	9	7	7	9	4	14	5	12	9	4	8	5	6	3	156
11/14/97 (FRI)	9	2	0	3	1	6	7	7	9	9	10	5	6	9	8	3	7	11	3	5	3	2	5	4	134
11/15/97 (SAT)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11/16/97 (SUN)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/17/97 (MON)	0	0	0	0	0	0	0	10	0	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	16
11/18/97 (TUE)	0	0	0	0	0	0	1	0	1	2	2	0	3	0	2	0	0	0	0	0	0	0	0	0	11
11/19/97 (WED)	0	0	0	0	0	0	4	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	7
11/20/97 (THU)	0	0	0	0	0	0	0	13	1	1	1	2	5	3	1	0	0	0	0	0	0	0	0	0	27
11/21/97 (FRI)	0	0	0	0	0	0	29	3	3	2	7	3	3	8	1	0	0	0	0	0	0	0	0	0	59
11/22/97 (SAT)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/23/97 (SUN)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
11/24/97 (MON)	0	5	0	2	3	12	58	8	5	7	6	9	11	4	12	3	10	11	10	7	11	2	4	5	205
11/25/97 (TUE)	4	1	1	1	7	8	8	7	9	10	7	13	10	9	3	9	8	6	8	7	6	7	9	5	163
11/26/97 (WED)	5	0	0	4	6	9	3	12	4	11	6	14	9	11	8	5	8	7	11	6	5	4	2	5	155
11/27/97 (THU)	0	0	0	2	1	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	6
11/28/97 (FRI)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	2	0	7
11/29/97 (SAT)	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	1	0	6
11/30/97 (SUN)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	63	36	18	26	59	150	244	136	98	125	121	144	153	145	104	93	119	104	105	88	94	73	88	76	2462
Avg: 30 days	2	1	1	1	2	5	8	5	3	4	4	5	5	5	3	3	4	3	4	3	3	2	3	3	

804

805

FIG. 8A

ARRIVAL COUNT REPORT

801

Report covers the dates: 11/01/1997 thru 11/30/1997 - 30 day(s)
Report includes the following carriers: ALL

2. Summary by Day of Week

Day Of Week	# of Days in date range	Total # of Arrivals	Average # of Arrivals
SUN	5	7	1.40
MON	4	642	160.50
TUE	4	519	129.75
WED	4	540	135.00
THU	4	360	90.00
FRI	4	378	94.50
SAT	5	16	3.20
		2462	

806

3. Summary by Hour of Day, By Day of Week

3A. Total number of Arrivals

Day of Week	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
SUN	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	4	7
MON	0	7	4	5	12	44	132	34	23	27	24	31	33	28	27	23	31	27	26	24	24	19	20	17	642
TUE	16	5	4	3	15	28	22	22	23	30	29	30	40	31	22	20	29	19	25	21	18	23	29	15	519
WED	18	9	2	6	11	36	26	31	19	32	24	35	39	36	26	19	28	21	25	23	25	11	14	24	540
THU	10	8	5	5	12	22	15	30	13	15	17	24	20	23	16	19	12	10	20	10	15	11	11	8	360
FRI	15	7	3	7	8	19	48	17	20	20	25	24	20	25	13	11	19	19	9	9	12	8	12	8	378
SAT	4	0	0	0	1	1	0	1	0	1	2	0	0	2	0	1	0	0	0	1	0	1	1	0	16
Total	63	36	18	26	59	150	244	136	98	125	121	144	153	145	104	93	119	104	105	88	94	73	88	76	2462
Avg: 30 days	2	1	1	1	2	5	8	5	3	4	4	5	5	5	3	3	4	3	4	3	3	2	3	3	

807

3B. Average number of Arrivals

Day of Week	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
5 SUNs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4 MONs	0	2	1	1	3	11	33	9	6	7	6	8	8	7	7	6	8	7	7	6	6	5	5	4
4 TUEs	4	1	1	1	4	7	6	6	6	8	7	9	10	8	6	5	7	5	6	5	5	6	7	4
4 WEDs	5	2	1	2	3	9	7	8	5	8	6	9	10	9	7	5	7	5	6	6	6	3	4	6
4 THUs	3	2	1	1	3	6	4	8	3	4	4	6	5	6	4	5	3	5	5	3	4	3	3	2
4 FRIs	4	2	1	2	2	5	12	4	5	5	6	6	5	6	3	3	5	5	2	2	3	2	3	2
5 SATs	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

808

FIG. 8B

SWITCH COUNT REPORT

901

902

903

904

Report covers the dates: 11/01/1997 thru 11/30/1997 - 30 day(s)
REPORT ONLY COUNTS INBOUND SWITCHES TO DOCKS-ALL

1. Detailed Listing by Hour of Day

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
11/01/97 (SAT)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11/02/97 (SUN)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/03/97 (MON)	0	0	0	0	0	0	7	10	12	13	13	4	12	14	9	0	13	11	10	12	8	6	6	9	169
11/04/97 (TUE)	1	0	0	0	0	2	10	7	10	20	12	4	9	10	1	0	11	13	8	11	10	5	1	8	153
11/05/97 (WED)	1	0	0	0	0	0	8	11	13	10	11	1	11	15	2	0	17	13	6	10	10	3	3	4	149
11/06/97 (THU)	0	0	0	0	0	0	7	15	8	14	10	5	2	9	9	1	13	15	9	8	9	3	12	0	149
11/07/97 (FRI)	3	0	0	0	0	0	9	11	10	7	11	5	7	4	4	0	7	0	11	16	8	7	10	1	131
11/08/97 (SAT)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
11/09/97 (SUN)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/10/97 (MON)	0	0	0	0	0	1	6	9	8	14	7	7	10	11	4	0	12	10	11	17	5	1	14	4	151
11/11/97 (TUE)	2	0	0	0	0	0	7	16	7	7	8	4	15	7	1	0	20	10	5	12	7	0	7	4	139
11/12/97 (WED)	0	0	0	0	0	0	11	13	10	9	14	3	10	7	5	0	15	12	4	15	9	4	5	3	149
11/13/97 (THU)	3	0	0	0	0	1	11	14	4	12	10	4	8	5	7	0	15	8	9	14	9	3	7	8	152
11/14/97 (FRI)	1	0	0	0	0	1	8	7	14	4	14	2	8	5	5	1	10	17	6	11	4	3	5	4	130
11/15/97 (SAT)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/16/97 (SUN)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/17/97 (MON)	0	0	0	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	4
11/18/97 (TUE)	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
11/19/97 (WED)	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
11/20/97 (THU)	0	0	0	0	0	0	0	0	5	0	0	2	0	0	5	0	0	0	0	0	0	0	0	0	12
11/21/97 (FRI)	0	0	0	0	0	0	0	0	0	8	0	2	0	0	10	0	0	0	0	0	0	0	0	0	20
11/22/97 (SAT)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/23/97 (SUN)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/24/97 (MON)	0	0	0	0	0	0	14	8	3	19	7	6	12	9	4	0	17	16	7	12	17	3	8	3	165
11/25/97 (TUE)	4	0	0	0	0	0	8	12	5	14	11	7	12	7	2	0	15	17	11	8	11	6	8	3	161
11/26/97 (WED)	1	0	0	0	0	0	7	13	9	7	8	9	7	8	5	0	16	12	8	4	13	5	4	1	137
11/27/97 (THU)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/28/97 (FRI)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/29/97 (SAT)	0	0	0	0	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	5
11/30/97 (SUN)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	19	0	0	0	0	5	114	147	122	158	139	67	124	111	75	2	181	154	105	150	120	49	90	52	1984
Avg: 30 days	1	0	0	0	0	0	4	5	4	5	5	2	4	4	3	0	6	5	4	5	4	2	3	2	

FIG. 9A

SWITCH COUNT REPORT

Report covers the dates: 11/01/1997 thru 11/30/1997 - 30 day(s)
REPORT ONLY COUNTS INBOUND SWITCHES TO DOCKS=ALL

901

2. Summary by Day of Week

905 906

Day Of Week	# of Days in date range	Total # of Switches	Average # of Switches
SUN	5	0	0
MON	4	489	122
TUE	4	456	114
WED	4	437	109
THU	4	313	78
FRI	4	281	70
SAT	5	8	2
		1984	

3. Summary by Hour of Day, By Day of Week

3A. Total number of Switches

Day of Week	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
SUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MON	0	0	0	0	0	1	27	28	24	46	28	17	34	34	18	0	42	37	28	41	30	10	28	16	489
TUE	7	0	0	0	0	2	26	35	24	41	31	15	36	24	4	0	46	40	24	31	28	11	16	15	456
WED	2	0	0	0	0	0	26	37	33	26	33	13	28	30	13	0	48	37	18	29	32	12	12	8	437
THU	3	0	0	0	0	1	18	29	17	25	20	11	10	14	21	1	28	23	18	22	18	6	19	8	313
FRI	4	0	0	0	0	1	17	18	24	19	25	9	15	9	19	1	17	17	17	27	12	10	15	5	281
SAT	3	0	0	0	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	8
Total	19	0	0	0	0	5	114	147	122	158	139	67	124	111	75	2	181	154	105	150	120	49	90	52	1984
Avg: 30 days	1	0	0	0	0	0	4	5	4	5	5	2	4	4	3	0	6	5	4	5	4	2	3	2	

906

3B. Average number of Switches

Day of Week	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
5 SUNs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 MONs	0	0	0	0	0	0	7	7	6	12	7	4	9	9	5	0	11	9	7	10	8	3	7	4
4 TUEs	2	0	0	0	0	1	7	9	6	10	8	4	9	6	1	0	12	10	6	8	7	3	4	4
4 WEDs	1	0	0	0	0	0	7	9	8	7	8	3	7	8	3	0	12	9	5	7	8	3	3	2
4 THUs	1	0	0	0	0	0	5	7	4	7	5	3	3	4	5	0	7	6	5	6	5	2	5	2
4 FRIs	1	0	0	0	0	0	4	5	6	5	6	2	4	2	5	0	4	4	4	7	3	3	4	1
5 SATs	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

907

FIG. 9B

1001 LIVE UNLOAD EXCEPTION REPORT

Report covers the dates: 12/04/97 thru 12/04/97
Include data from Archives: No
Report sorted by Carrier/Trailer #
CARRIERS=LEHM

Total number of LU arrivals : 2
Number of LU exceptions : 5
Total number of exception spots: 5

1002 Carrier	1003 Trailer	1004 Arrived	1005 First Move	1006 Moves	1007 Departed	1008 Status
LEHM	5014	12/03/97 @ 22:32	12/04/97 @ 00:34	1	12/04/97 @ 01:25	RO
LEHM	5052	12/03/97 @ 23:52	12/04/97 @ 06:37	1	12/04/97 @ 10:09	RO
LEHM	5054	12/03/97 @ 23:17	12/04/97 @ 01:09	1	12/04/97 @ 03:17	RO
LEHM	5060	12/03/97 @ 20:51	12/03/97 @ 22:20	1	12/04/97 @ 03:23	RO
LEHM	5062	12/04/97 @ 12:59	12/04/97 @ 16:24	1	12/04/97 @ 17:03	RO

FIG. 10A

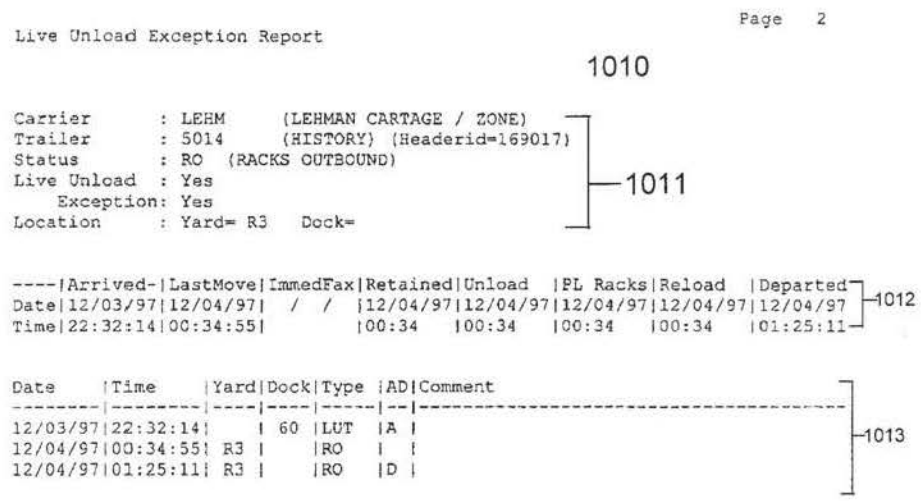
Page 2
Live Unload Exception Report
1010
Carrier : LEHM (LEHMAN CARTAGE / ZONE)
Trailer : 5014 (HISTORY) (Headerid=169017)
Status : RO (RACKS OUTBOUND)
Live Unload : Yes
Exception: Yes
Location : Yard= R3 Dock=
1011
----|Arrived-|LastMove|ImmedFax|Retained|Unload |PL Racks|Reload |Departed
Date|12/03/97|12/04/97| / / |12/04/97|12/04/97|12/04/97|12/04/97|12/04/97
Time|22:32:14|00:34:55| |00:34 |00:34 |00:34 |00:34 |01:25:11
1012
Date |Time |Yard|Dock|Type |AD|Comment
12/03/97|22:32:14| | 60 |LUT |A |
12/04/97|00:34:55| R3 | |RO | |
12/04/97|01:25:11| R3 | |RO |D |
1013

FIG. 10B

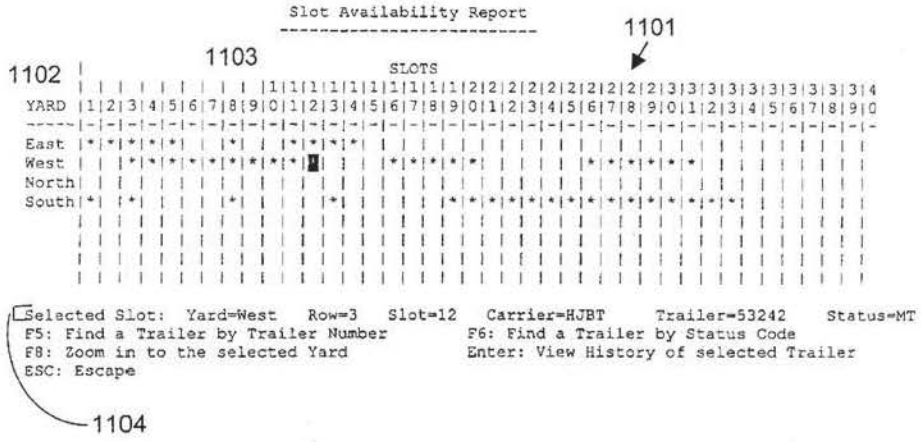
Slot Availability Report
1101
1103
1102
SLOTS
YARD
East
West
North
South
Selected Slot: Yard=West Row=3 Slot=12 Carrier=HJBT Trailer=53242 Status=MT
F5: Find a Trailer by Trailer Number
F6: Find a Trailer by Status Code
F8: Zoom in to the selected Yard
Enter: View History of selected Trailer
ESC: Escape
1104

FIG. 11A

Slot Availability Report
Yard Selection Screen

1106

1107 1108

Yard ID	Yard Name
BB	Butler Bld
East	East Yard
North	North Yard
NPS	New Paint Shop
South	South Yard
West	West Yard

Enter: Display Row Selection Screen
↑↓: Scroll Up or Down
PageUp/PageDown: Full Page Up or Down
F5: Find Trailer by Trailer Number
F6: Find a Trailer by Status Code
ESC: Finished

FIG. 11B

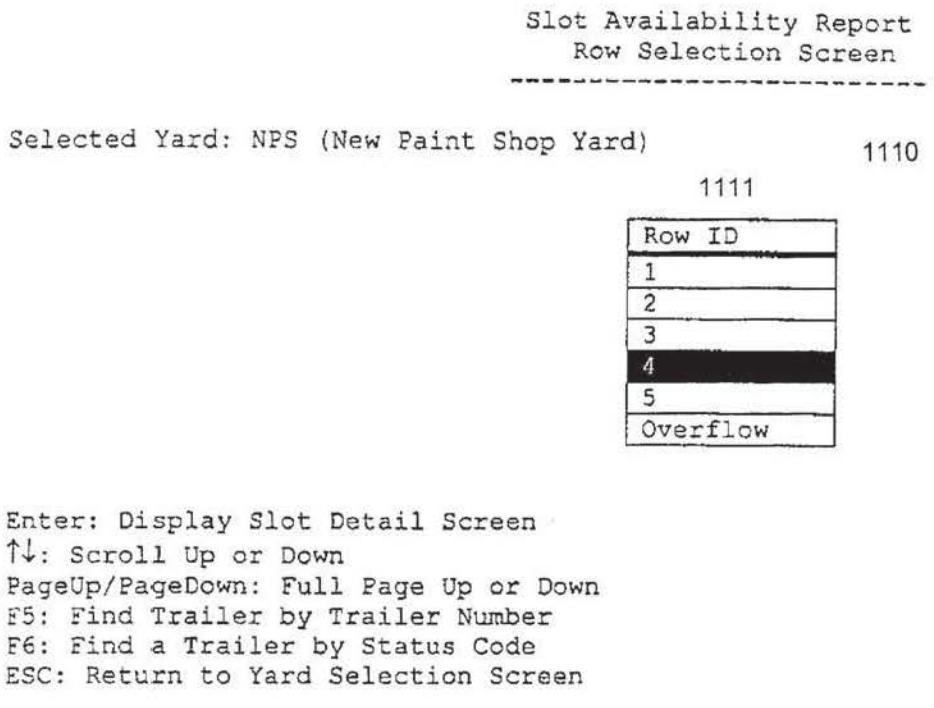
Slot Availability Report
Row Selection Screen
Selected Yard: NPS (New Paint Shop Yard)
1110
1111
Row ID
1
2
3
4
5
Overflow
Enter: Display Slot Detail Screen
↑↓: Scroll Up or Down
PageUp/PageDown: Full Page Up or Down
F5: Find Trailer by Trailer Number
F6: Find a Trailer by Status Code
ESC: Return to Yard Selection Screen

FIG. 11C

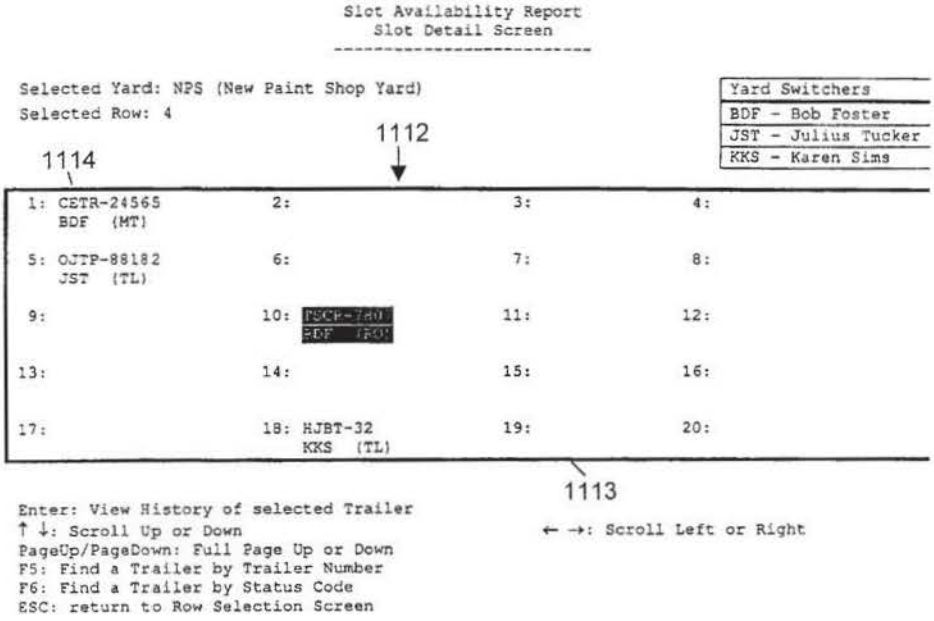
Slot Availability Report
Slot Detail Screen
Selected Yard: NPS (New Paint Shop Yard)
Selected Row: 4
1114
1112
Yard Switchers
BDF - Bob Foster
JST - Julius Tucker
KKS - Karen Sims
1: CETR-24565
BDF (MT)
2:
3:
4:
5: OJTP-88182
JST (TL)
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:
16:
17:
18: HJBT-32
KKS (TL)
19:
20:
1113
Enter: View History of selected Trailer
↑ ↓: Scroll Up or Down
← →: Scroll Left or Right
PageUp/PageDown: Full Page Up or Down
F5: Find a Trailer by Trailer Number
F6: Find a Trailer by Status Code
ESC: return to Row Selection Screen

FIG. 11D

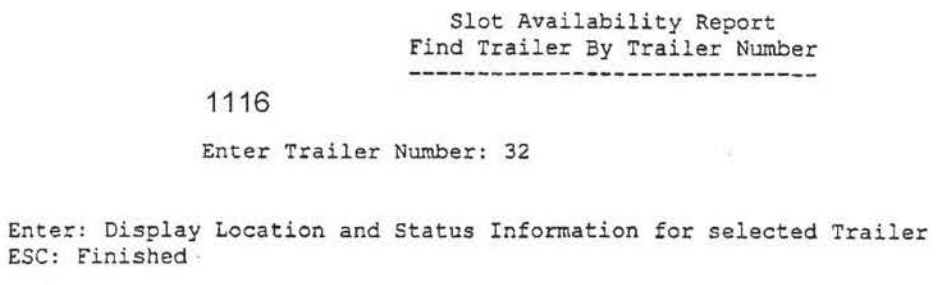
Slot Availability Report
Find Trailer By Trailer Number
1116
Enter Trailer Number: 32
Enter: Display Location and Status Information for selected Trailer
ESC: Finished

FIG. 11E

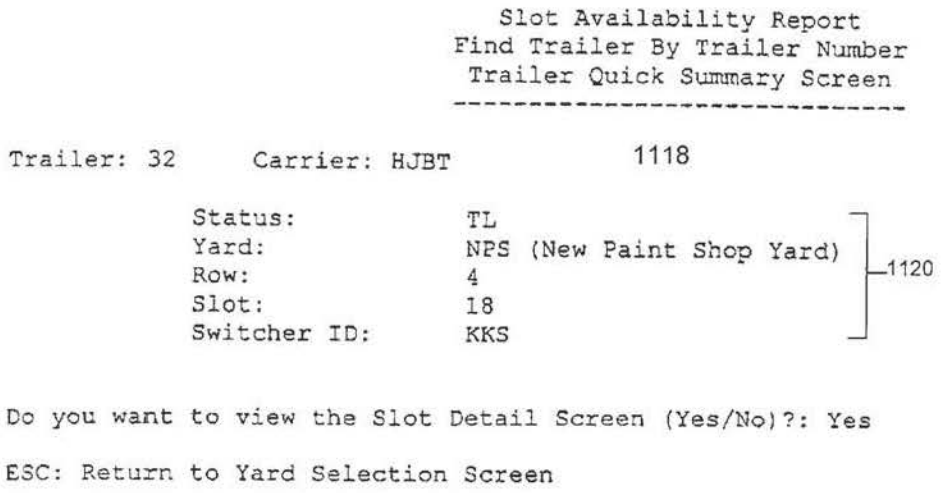
Slot Availability Report
Find Trailer By Trailer Number
Trailer Quick Summary Screen
Trailer: 32 Carrier: HJBT
1118
Status: TL
Yard: NPS (New Paint Shop Yard)
Row: 4
Slot: 18
Switcher ID: KKS
1120
Do you want to view the Slot Detail Screen (Yes/No)?: Yes
ESC: Return to Yard Selection Screen

FIG. 11F

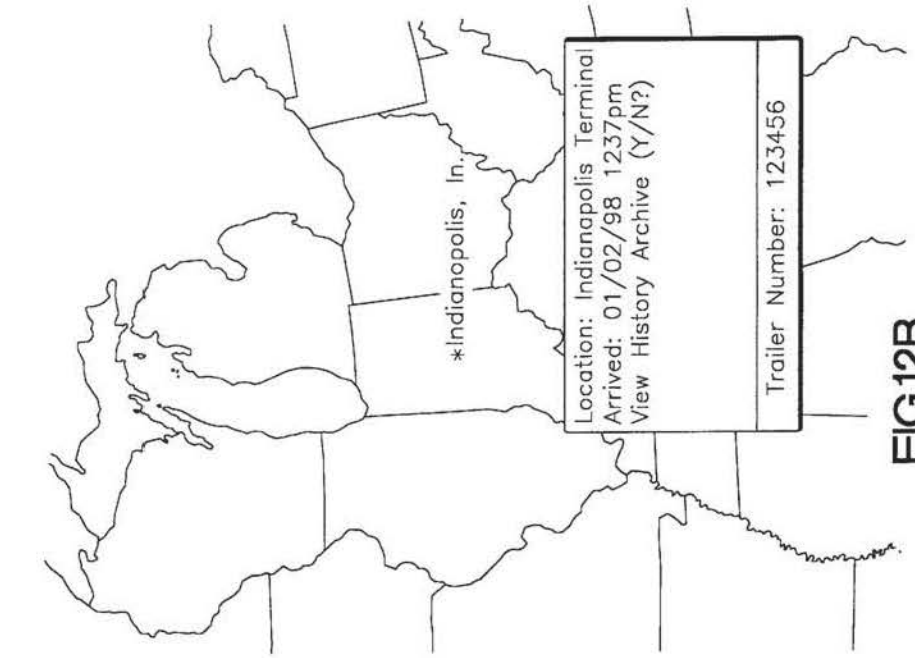

FIG.12B

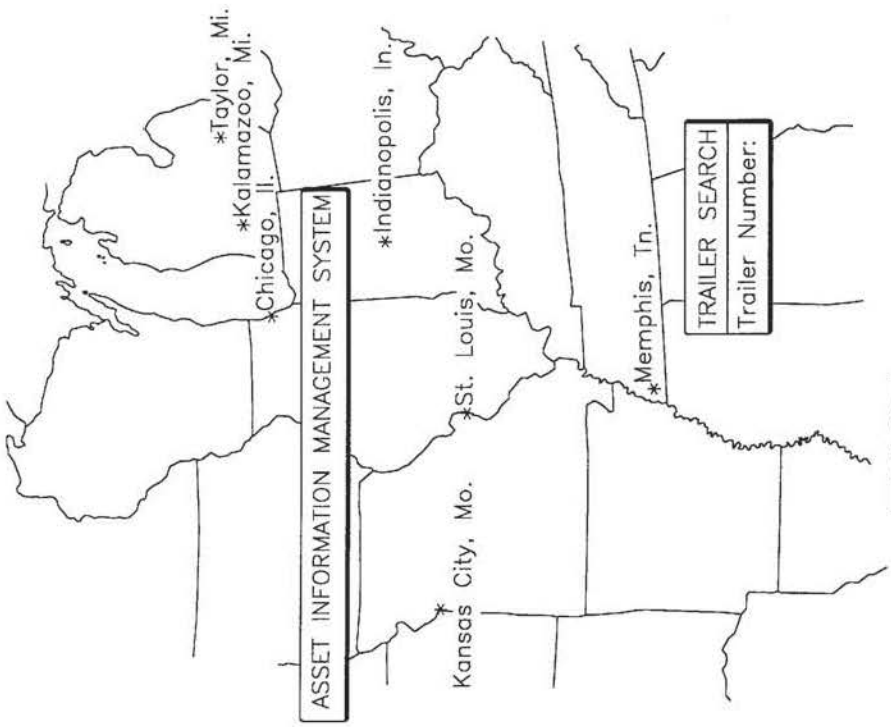

FIG.12A

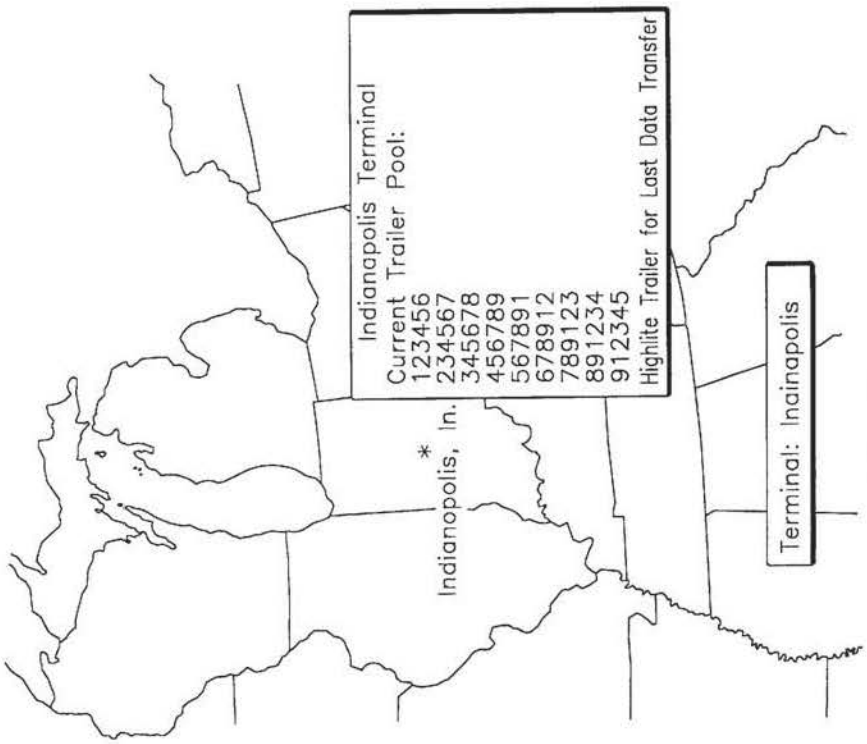

FIG.12D

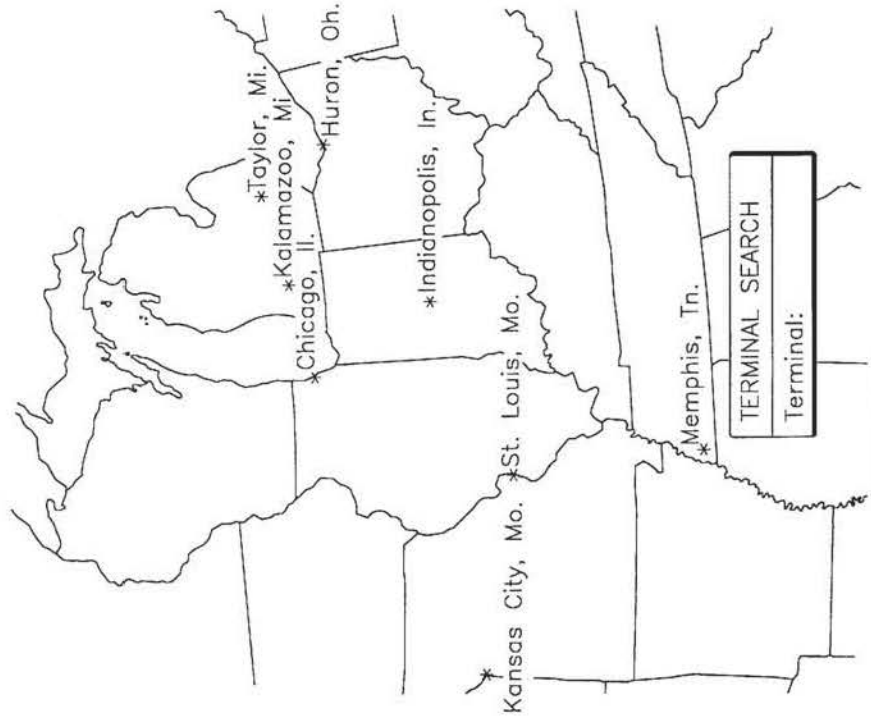

FIG.12C

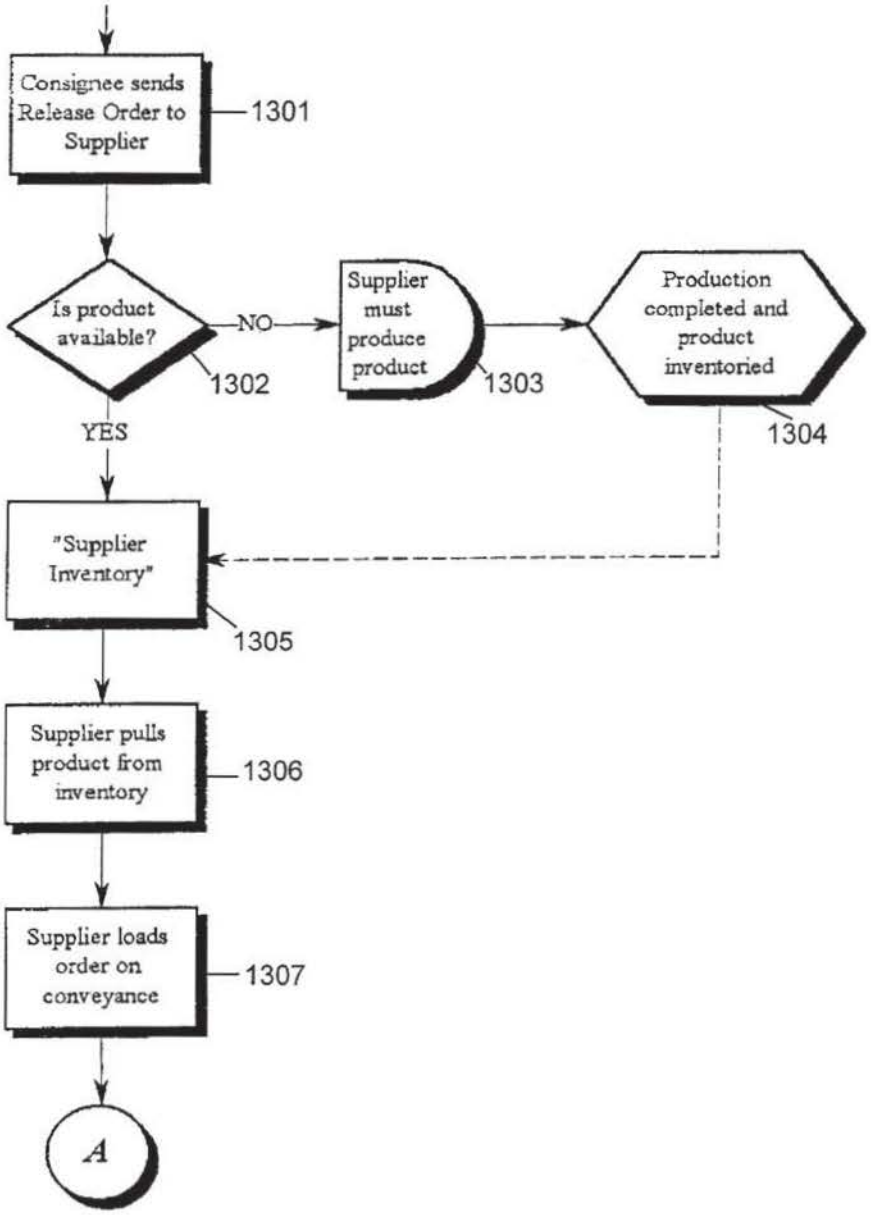
Consignee sends Release Order to Supplier
1301
Is product available?
NO
1302
Supplier must produce product
1303
Production completed and product inventoried
1304
YES
"Supplier Inventory"
1305
Supplier pulls product from inventory
1306
Supplier loads order on conveyance
1307
A

FIG. 13A

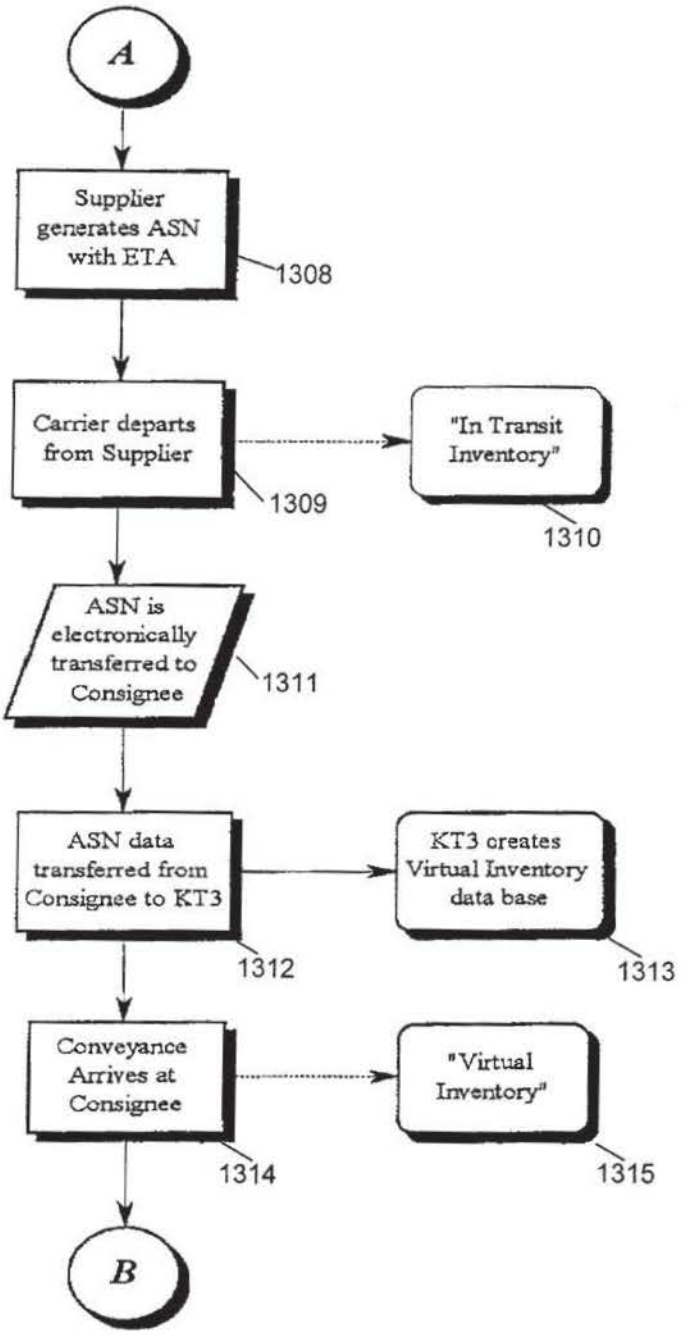
A
Supplier generates ASN with ETA
1308
Carrier departs from Supplier
1309
"In Transit Inventory"
1310
ASN is electronically transferred to Consignee
1311
ASN data transferred from Consignee to KT3
1312
KT3 creates Virtual Inventory data base
1313
Conveyance Arrives at Consignee
1314
"Virtual Inventory"
1315
B

FIG. 13B

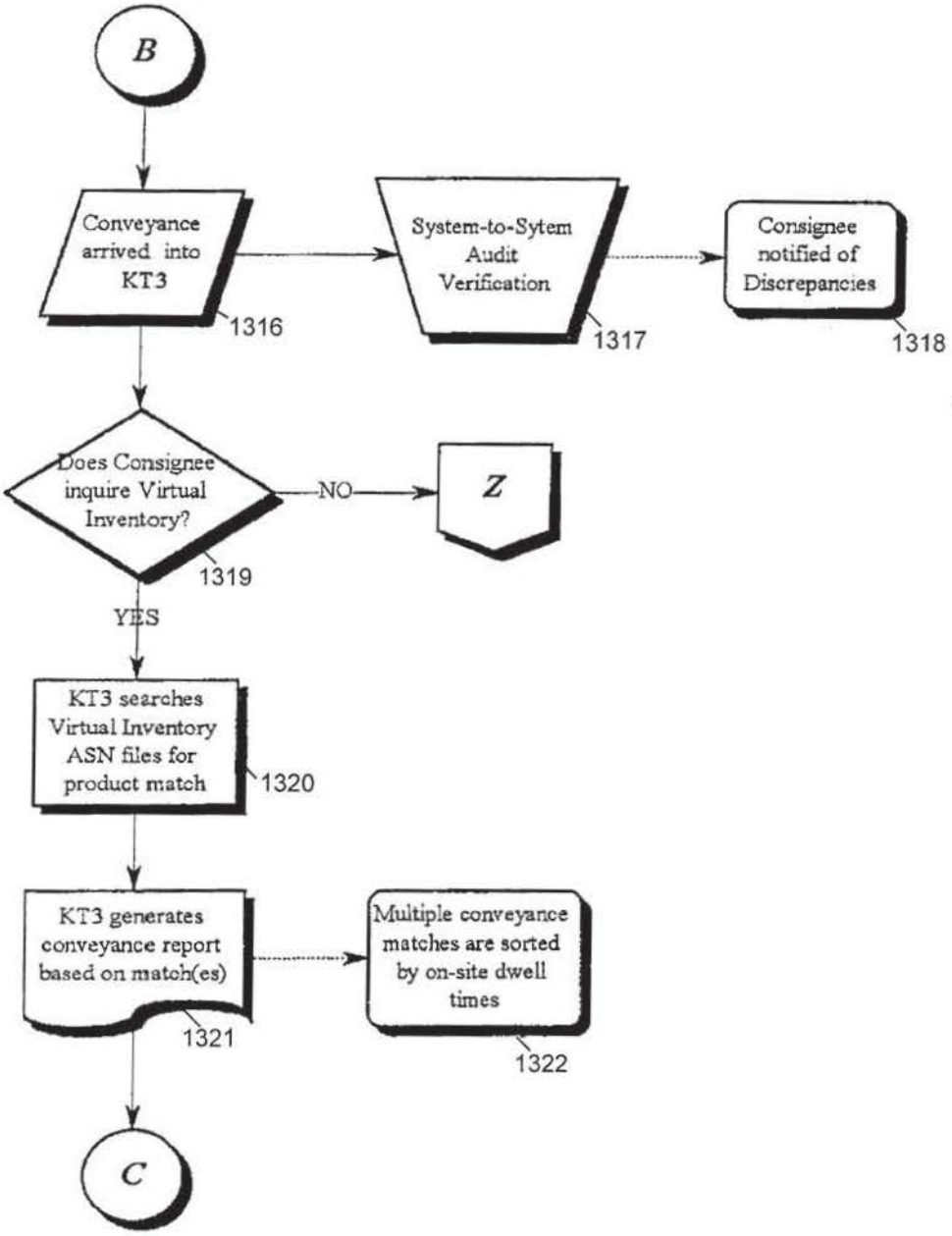
B
Conveyance arrived into KT3
1316
System-to-Sytem Audit Verification
1317
Consignee notified of Discrepancies
1318
Does Consignee inquire Virtual Inventory?
1319
NO
Z
YES
KT3 searches Virtual Inventory ASN files for product match
1320
KT3 generates conveyance report based on match(es)
1321
Multiple conveyance matches are sorted by on-site dwell times
1322
C

FIG. 13C

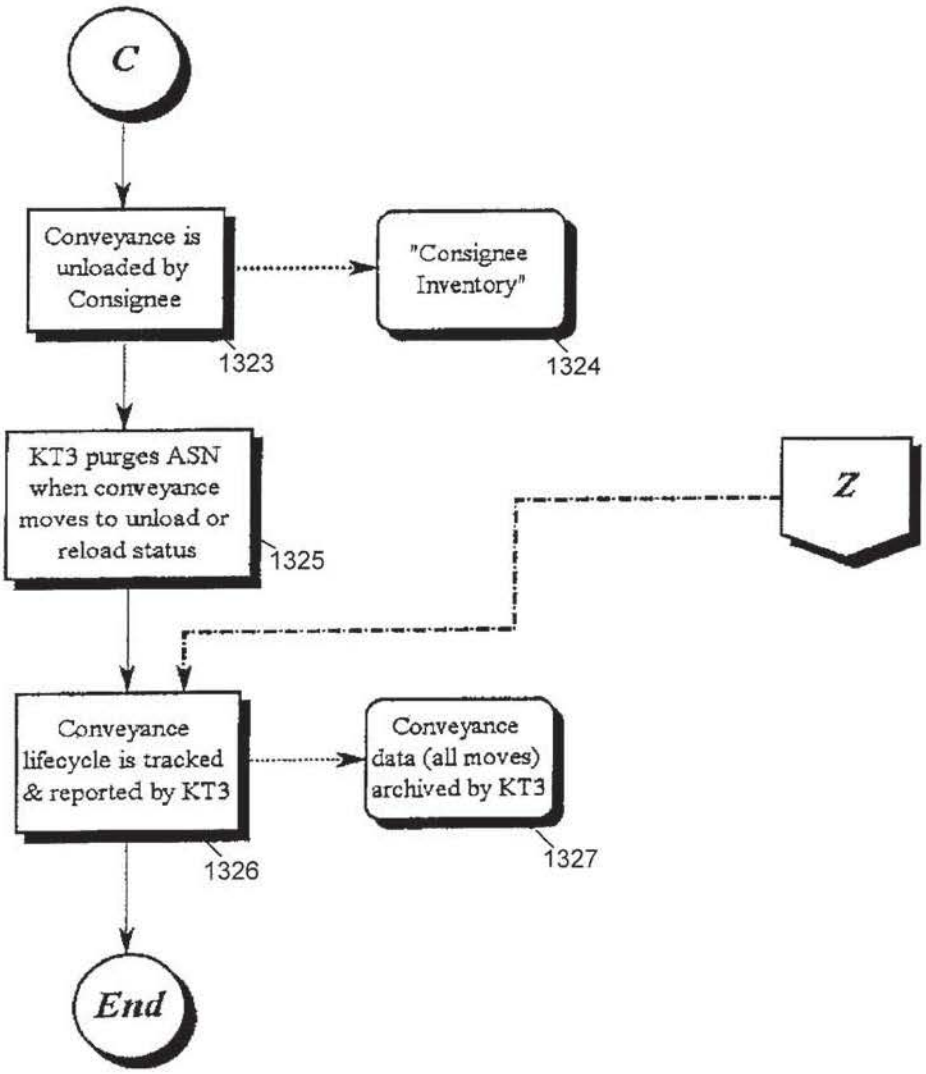
C
Conveyance is unloaded by Consignee
1323
"Consignee Inventory"
1324
KT3 purges ASN when conveyance moves to unload or reload status
1325
Z
Conveyance lifecycle is tracked & reported by KT3
1326
Conveyance data (all moves) archived by KT3
1327
End

FIG. 13D

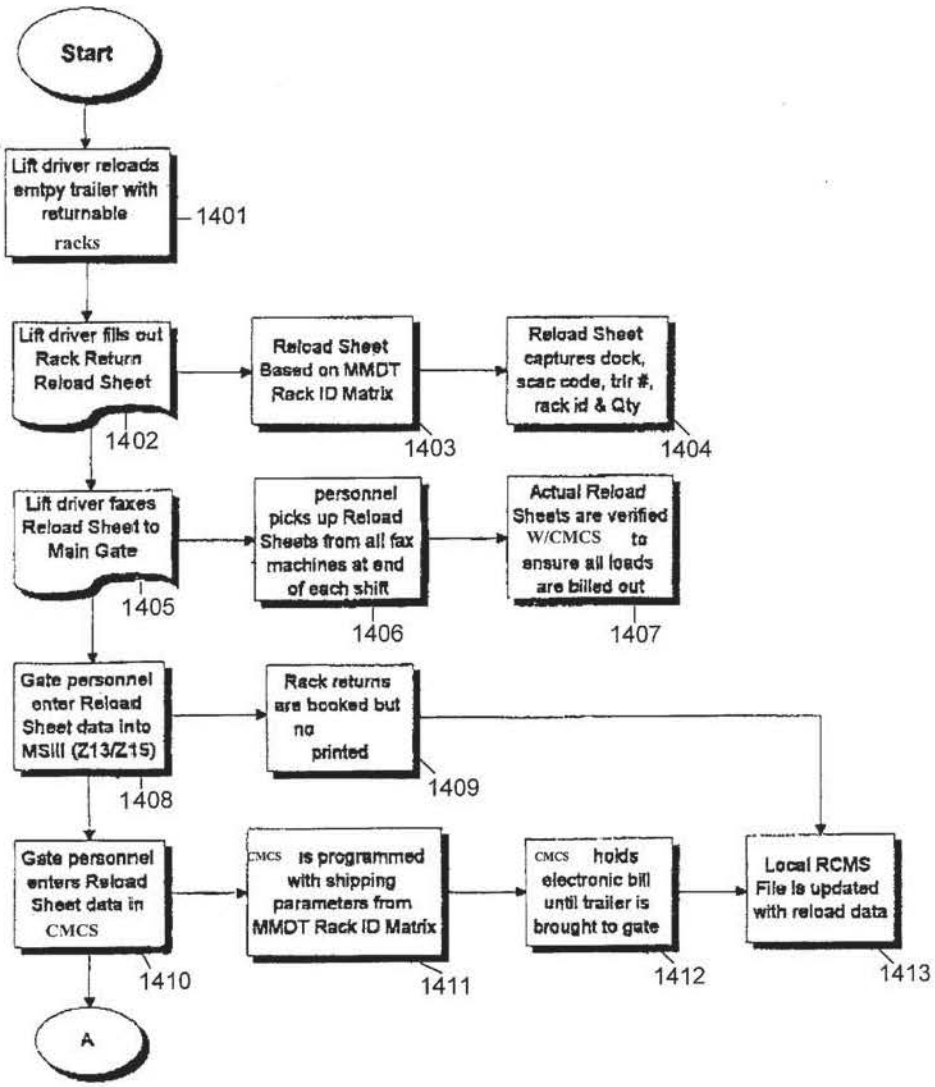
Start
Lift driver reloads emtpy trailer with returnable racks
1401
Lift driver fills out Rack Return Reload Sheet
1402
Reload Sheet Based on MMDT Rack ID Matrix
1403
Reload Sheet captures dock, scac code, trlr #, rack id & Qty
1404
Lift driver faxes Reload Sheet to Main Gate
1405
personnel picks up Reload Sheets from all fax machines at end of each shift
1406
Actual Reload Sheets are verified W/CMCS to ensure all loads are billed out
1407
Gate personnel enter Reload Sheet data into MSIII (Z13/Z15)
1408
Rack returns are booked but no printed
1409
Gate personnel enters Reload Sheet data in CMCS
1410
CMCS is programmed with shipping parameters from MMDT Rack ID Matrix
1411
CMCS holds electronic bill until trailer is brought to gate
1412
Local RCMS File is updated with reload data
1413
A

FIG. 14A

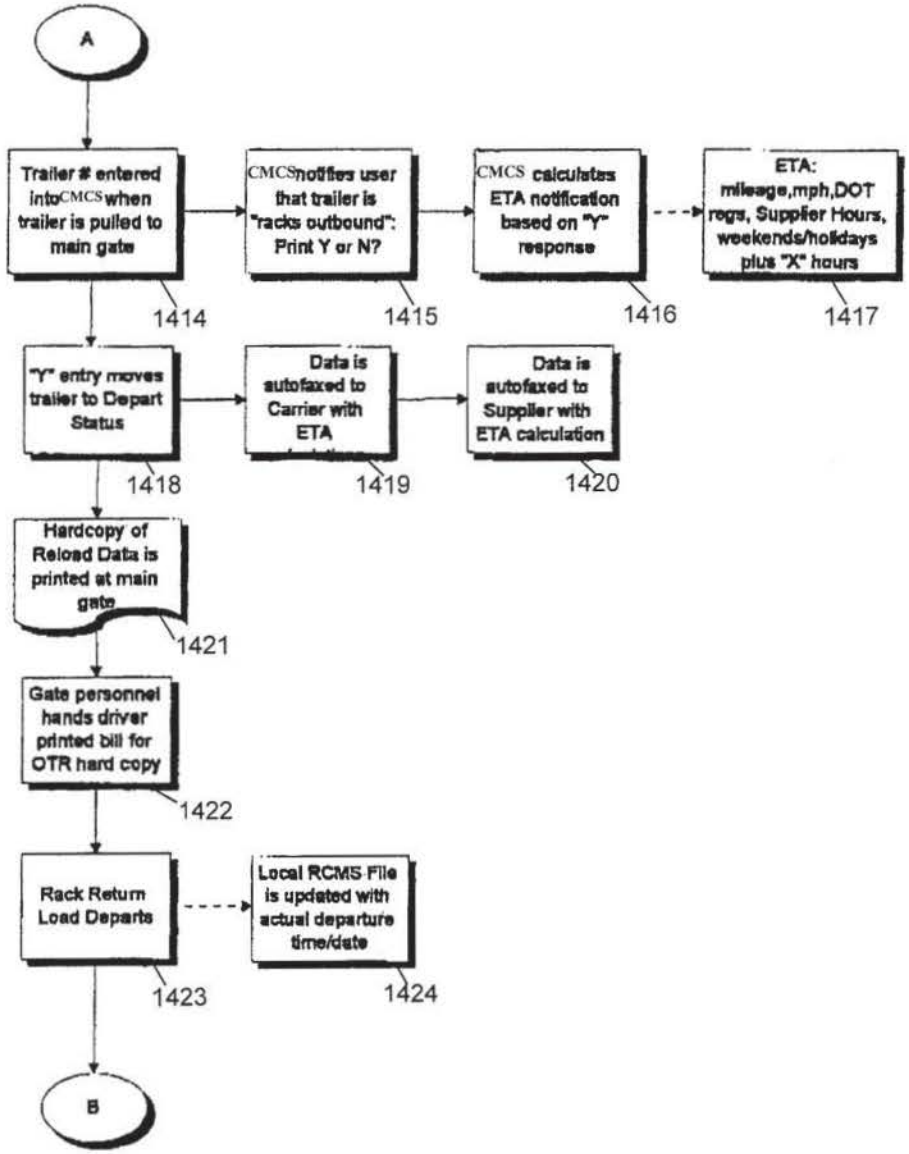
A
Trailer # entered into CMCS when trailer is pulled to main gate
CMCS notifies user that trailer is "racks outbound": Print Y or N?
CMCS calculates ETA notification based on "Y" response
ETA: mileage,mph,DOT regs, Supplier Hours, weekends/holidays plus "X" hours
1414
1415
1416
1417
"Y" entry moves trailer to Depart Status
Data is autofaxed to Carrier with ETA
Data is autofaxed to Supplier with ETA calculation
1418
1419
1420
Hardcopy of Reload Data is printed at main gate
1421
Gate personnel hands driver printed bill for OTR hard copy
1422
Rack Return Load Departs
Local RCMS File is updated with actual departure time/date
1423
1424
B

FIG. 14B

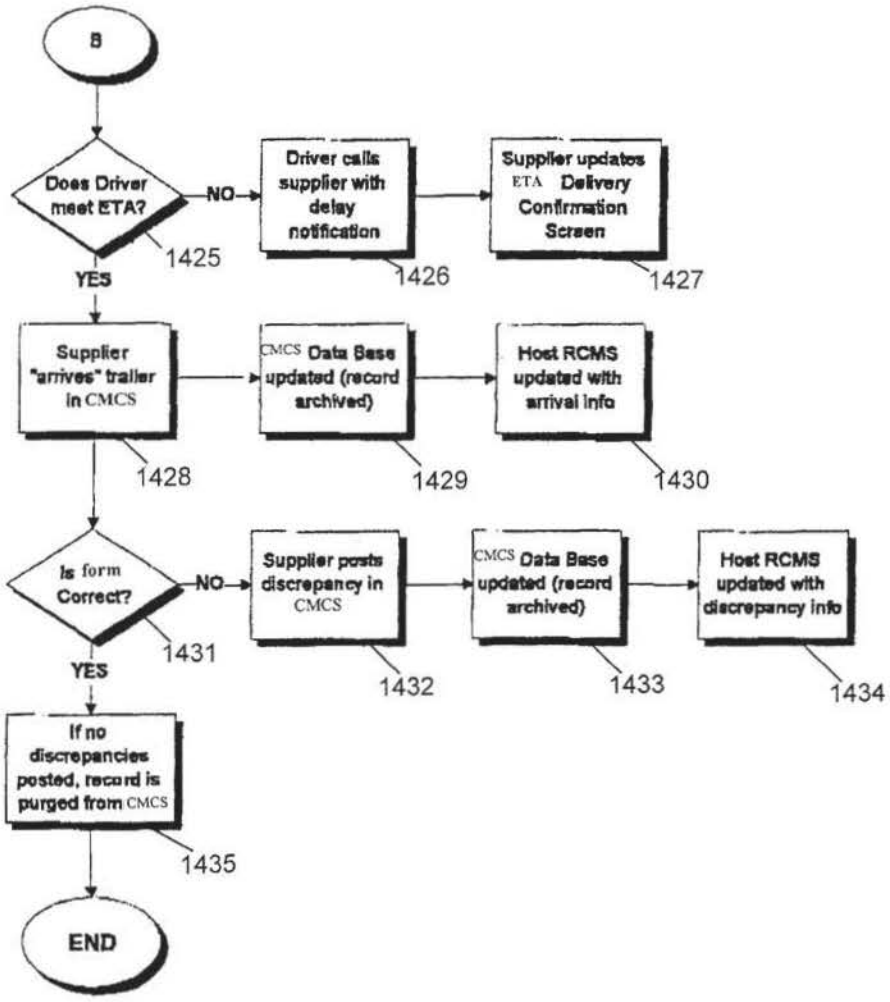
B
Does Driver meet ETA?
NO
YES
1425
Driver calls supplier with delay notification
1426
Supplier updates ETA Delivery Confirmation Screen
1427
Supplier "arrives" trailer in CMCS
1428
CMCS Data Base updated (record archived)
1429
Host RCMS updated with arrival info
1430
Is form Correct?
NO
YES
1431
Supplier posts discrepancy in CMCS
1432
CMCS Data Base updated (record archived)
1433
Host RCMS updated with discrepancy info
1434
If no discrepancies posted, record is purged from CMCS
1435
END

FIG. 14C

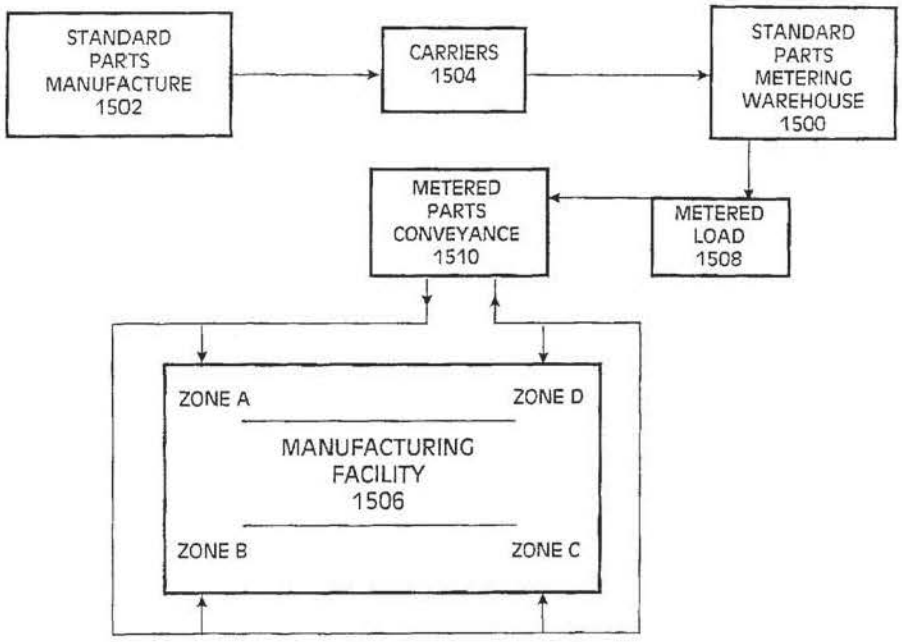
STANDARD PARTS MANUFACTURE 1502
CARRIERS 1504
STANDARD PARTS METERING WAREHOUSE 1500
METERED PARTS CONVEYANCE 1510
METERED LOAD 1508
ZONE A
ZONE D
MANUFACTURING FACILITY 1506
ZONE B
ZONE C

FIG. 15

CONTAINER AND INVENTORY MONITORING METHODS AND SYSTEMS

RELATED APPLICATIONS

This patent application is related to U.S. patent application Ser. No. 08/519,888, filed Aug. 28, 1995, issued as U.S. Pat. No. 5,712,789.

FIELD OF THE INVENTION

The present invention pertains generally to logistics methods and systems for tracking and control of containers, shipping racks and inventory. More particularly, the invention pertains to methods and systems which create and maintain an accurate record of the location and movement of containers, racks and inventory within the boundaries and between sites such as factories, assembly plants, warehouses, shipping yards and freight switching facilities.

BACKGROUND OF THE INVENTION

In the related application, a method and system is described for monitoring the location and load status of containers within the boundaries of a manufacturing or shipping or warehouse facility. The invention eliminates the substantial cost of locating containers within sprawling shipping container receiving yards, so that the container can be readily brought to an assigned dock for unloading. The present application focuses even more closely on the movement and load status of containers in transit and within yards and production facilities such as automobile factories, and describes unobvious enhancements and additions to the container monitoring methods and systems which yield even more accurate and detailed information on the location and status of containers, shipping racks, and running inventories. The described enhancements reduce waste and inefficiency in the common shipping process from a supplier (such as a manufacturer of parts), a carrier (such as a trucking or shipping or freight forwarding company), a warehouse, and an end customer who assembles parts together to make a complete product.

Tracking of containers in transit is well developed, including the use of satellites and other electronic technology to obtain real-time data on in transit locations. Inventory accounting and management is also a well developed filed in which the contents of very large warehouses are ascertainable to high level of detail at any point in time. Areas which lack total control over the status and accounting of goods and the conveyances needed to move the goods are in yards in which containers are received at a facility, and in the facilities. Without information on the location and load status of containers at a facility, or an accounting for a number of parts (especially small parts) within a facility, a manufacturer or supplier or carrier has no way of calculating a current, real-time accounting of assets.

For example, in a typical sale and shipment of goods transaction, a carrier may know from a satellite tracking system that a container has reached a factory, but does not know if the container has been emptied, partially emptied, reloaded, or the contents of a reload such as racks. The carrier's "asset" in the shipping transaction is a bill of lading which he presents to the factory upon completion of the delivery. But the bill of lading cannot be paid upon until the delivery is complete. Thus the carrier must have information on the load status of the container at the factory. A supplier's asset is the account receivable for the goods delivered to the factory. Payment of the supplier's invoice may be conditioned upon not only delivery of the goods, but actual assembly of the goods into a finished product, known as "paid-on-production". The supplier's assets may also include be considered to include any racks which must be returned to the supplier so that a subsequent shipment of goods can be made. In some cases the supplier may in fact own the racks and is therefore further interested in having them returned. If the supplier does not learn of an incorrect return shipment of racks until a carrier arrives at the supplier's facility, the supplier (and possibly the customer) have incurred a loss. The customer's asset is of course the ordered goods such as parts. To reduce or eliminate the cost of holding parts prior to assembly, the customer wants to receive the goods ideally not until the time at which they are needed for assembly. To coordinate this, the customer must have information on the transport of the goods to the factory by the carrier. While just-in-time delivery of parts is a good concept which can be applied to some manufacturing operations, it is not practical for all production. Therefore, the customer inevitably ends up holding some parts on the premises and is in effect functioning as a warehouse. In order to minimize the cost of this holding or warehousing, the customer must know which goods have arrived in which containers, and where the containers are located.

Another critical area which is not addressed at all by most logistics systems is that of racks which support product within a container. In many respects, these racks, their location, expected time of arrival on return, and condition, are just as critical and valuable as the products they carry. For without racks, many products cannot be shipped. There is thus a need to track shipping racks, particularly on the return trip to suppliers, as closely as the shipment of product.

The prior art has also overlooked the logistical management of relatively small parts such as fasteners or electronic components. Small parts are typically delivered in containers of progressively smaller size, from pallet to carton to box. Holding a quantity of small parts greater than is immediately required leads to losses within an assembly facility. Thus a system is needed to track the deliver of small parts containers and to monitor the running inventory in comparison to completed production.

SUMMARY OF THE INVENTION

The present invention provides methods and systems for improved logistical controls over shipping container tracking, switch monitoring and load status, and real-time total inventory accounting. In accordance with a fundamental aspect of the invention, a container monitoring system is provided for accumulating and storing information on shipping containers, including location and load status. The system includes a receiving area for receiving containers to be monitored by the system, the receiving area within a defined boundary within which container are to be monitored by the system, a container entry point at the boundary at which containers are identified by pre-existing identification codes which are recorded at the container entry point, a switching vehicle for moving containers to and from a receiving area and to and from a facility within the boundary according to instructions received from the facility, and means for recording information on location and load status of containers within the defined boundary, including information on receiving area identification, and identification of containers in designated slots within a receiving area.

The invention further provides computer means for generating reports on container arrivals at a facility, numbers of moves of a container by a switching vehicle within a

receiving area, and locations and unloading activities of containers at docks at a facility.

The invention also provides a system for monitoring and locating containers within a monitored network of container shipping terminals and destination facilities. The system enables a carrier to identify the terminal or facility within a network at which a particular container is located, to know where within a terminal or facility a container is located, and to know the load status of a container within a terminal of facility.

The invention also provides a virtual inventory tracking system which generates real-time data on product shipments within containers in transit, at a facility, and within a facility.

The invention also provides a method and system for creating electronic and paper records of shipping rack return activity from reloading of racks into a container to completed return of racks to a supplier.

And, the invention also provides a metered warehousing and delivery system for production driven delivery and control of small sized inventory.

These and other aspects of the invention are herein described in particularized detail with reference to the accompanying Figures, the Figures being representative of but some of the various ways in which the principles and concepts of the invention may be carried out.

BRIEF DESCRIPTION OF THE FIGURES

In the accompanying Figures:

FIG. **1** is a schematic diagram of the basic operational components of one embodiment of the container monitor and control system (CMCS) of the present invention;

FIG. **2** is a schematic diagram of the basic hardware components of the Container Monitor Control System (CMCS) of the present invention including related databases, management information systems and input and communications devices;

FIG. **3** is an example of a container status report generated by the container monitor and control system of the present invention;

FIG. **4** is an example of an Empty Trailor Report listing only trailor containors which are completely empty and ready for departure from the premises.

FIG. **5** is flow diagram of certain processing steps of the container monitor and control system of the present invention;

FIGS. **6**A–**6**C are representative screen displays generated by a computer program which performs certain functions of the container monitor and control system of the present invention;

FIGS. **7**A–**7**D are examples of screen displays and dock activity reports generated by a computer program which performs certain functions of the container monitor and control system of the present invention;

FIGS. **8**A–**8**B are examples of screen displays and summary reports of container arrivals at a facility generated by a computer program which performs certain functions of the container monitor and control system of the present invention;

FIGS. **9**A–**9**B are examples of screen displays and summary reports of container switching activity at a facility generated by a computer program which performs certain functions of the container monitor and control system of the present invention;

FIGS. **10**A–**10**B are examples of screen displays and live unload exception reports on container unloading activity at a facility generated by a computer program which performs certain functions of the container monitor and control system of the present invention;

FIGS. **11**A–**11**F are examples of screen displays and reports on container locations, identities, and load status within parking slots within container receiving yards, generated by a computer program which performs certain functions of the container monitor and control system of the present invention;

FIGS. **12**A–**12**D are examples of screen displays and reports pertaining to container locations at terminal within a monitored network of facilities or terminals, generated by a computer program which performs certain functions of the container monitor and control system of the present invention;

FIGS. **13**A–**13**D are flow diagrams of a virtual inventory tracking process of the present invention;

FIGS. **14**A–**14**C are flow diagrams of a process for recording, verifying and producing electronic and paper records for return delivery of shipping racks in accordance with the present invention, and

FIG. **15** is schematic diagram of a metered warehousing and parts delivery process and system in accordance with the present invention.

DETAILED DESCRIPTION OF PREFERRED AND ALTERNATE EMBODIMENTS

FIG. **1** schematically illustrates one application of a basic aspect of the container and inventory monitoring system of the invention, within the confines of a facility boundary B. A facility F may be a factory, warehouse sub-assembly plant, freight transfer station, distribution center, or any other place where shipping containers are loaded or unloaded. The facility boundary B is the area which surrounds or is associated with the facility F. As used herein, the term "system" refers to the described equipment, hardware and software used to carry out the described methods of container and inventory monitoring, and to the apparatus and equipment used to operate the system, including computer hardware and software, peripheral data input devices, monitors, communications devices and transportation vehicles, shipping containers and shipping racks. In the basic system shown in FIG. **1**, the system accumulates, stores and disseminates information on containers C with respect to the location of containers relative to facility boundary B locations within the facility boundaries but outside the facility referred to as the receiving areas or yards Y, and docks D which are designated entrances or doors to a facility F. Entry to and exit from the facility boundary B is directed through and controlled by gate G. As further described herein, important time sensitive data on containers and container loads which the system uses is collected at entry points to a facility boundary B such as gate G.

As further shown in FIG. **1**, each receiving area Y is assigned a unique designator such as **Y1**, **Y2**, etc. Each of the docks are uniquely designated such as **D1**, **D2**, etc. Movers of shipping containers, and each shipping container is also uniquely identified by a code or number. For example, in the trucking industry, each of the vehicles of carriers or shipping companies which move containers are uniquely identified by, for example, an alpha "SCAT" code which may correspond to the name of the shipping company. Each of the containers are assigned an individual code (usually numeric) which is combined with the SCAT code to identify every carrier/container combination. This combination of codes is used to track containers and monitor carrier performance.

The system is readily adaptable to other modes of shipping such as inter-modal ship/rail/truck containers, air freight containers, tankers, waste haulers, or any other type of shipping container. With coded identification of all carriers and containers, control over facility boundaries, and means for recording status and location of containers within a facility boundary, the system has the basic framework for compiling detailed data on the shipping process which can be used by the facility, suppliers and carriers to optimize logistics.

The system monitors and records all container movements and locations within the facility boundaries B. For example, when a container C is delivered by a carrier vehicle V to a facility through gate G, its arrival date and time is loaded into the system and it is located within a receiving area or yard Y by motive means S. The location of the container within the yard Y is also recorded, as is the number of times the container has been moved since its arrival at the facility boundary B. This data is transferred or made available to the computer system of the facility as further described below. The movement of a container within the facility boundary B or yard Y is referred to herein as a "switch". It is also generally referred to in the shipping industry as a "spot" or "drop".

FIG. **2** schematically illustrates an integrated system in which the computer system of the container and inventory monitoring system is combined with a computer system of a facility F. A container monitor and control system (CMCS) **10** includes a central processing unit **11** for receiving and processing container-related data, a container monitoring system database **12**, a virtual inventory database **13**, one or more container data input terminals **14** which may be locally or remotely located from the CMCS **10**, a CMCS monitor **15**, communications links **16** to remote computing systems and/or data receiving modules such as EDI, facsimile or e-mail or Internet connections, remote container data transceivers **18**, and one or more printers **20** for producing hard copy reports of container data acquired and processed by the CMCS **10**. In one possible hardware arrangement of the system **10**, one or more container data input terminals **14** and monitors **15** may be located at a gate or gates G for input of data acquired from incoming and outgoing containers into the CMCS **10**. Many different types of data input devices can be used in connection with the system to input data on carriers and containers. A human operator located at gate G can input the data as carrier/containers arrive. Other input methods and devices include hand held radios operated by drivers of the switching vehicles S to communicate data to an operator; RFID tag and reader technology, ultrasonic detectors, optical scanners or RF data communications devices such as manufactured by Texas Instruments and Teklogix, or bar code readers such s the Telxon PTC 921 and PTC 912DS. The switching vehicles S are preferably equipped with remote terminal reception and display devices which allow data input, data reception and real-time display on container locations and switching or movement instructions.

The CMCS **10** is interoperable with other computing systems such as for example a management information system (MIS) of a facility to which containers are delivered (referred to herein as the "1st customer MIS **30**" or "customer MIS"), and/or an end or intermediate customer (referred to herein as the "2d customer MIS **60**"), and/or an MIS of a container carrier business (herein "carrier MIS **40**"). As used herein, the term "customer" refers to a recipient of goods from a supplier, as delivered by a carrier. The customer may be a warehouse, freight forwarder, subassembler, final assembler or seller of the goods delivered.

As further shown in FIG. **2**, in a preferred embodiment of the invention the CMCS **10** is commonly linked with a plant or customer MIS **30** and container carrier MIS **40** for cross exchange of container and inventory data. Of course, connections could also be made to additional MISs and/or databases to further expand the accessibility of container data compiled by the CMCS **10**. An MIS typically includes a set of computerized data collection, analysis and reporting tools which support business decision processes, including a database accessible by a computer programmed with data analysis and reporting software to generate informational reports.

A typical container monitoring sequence is now described with reference to the physical arrangement of FIG. **1** and the monitoring hardware and software described above with reference to FIG. **2**. As a container C (pulled by a carrier vehicle V) approaches gate G of facility F, the carrier and container identifying indicia on the vehicle (for example a SCAT code) which is input to the CMCS along with a corresponding container number which appears on the exterior of the container, along with the time of arrival. The recorded time of arrival of a container starts a retention time clock to accurately measure the total amount of time a container is retained on the premises of the destination facility such as facility F. This information is critical to both carriers and customers. Container retention times recorded by the system clearly identify for carriers containers which are held for excessive amounts of time. Customers, i.e., the ultimate recipients of the container contents, who must pay carriers for excess retention time of containers can use the information provided by the system to independently verify charges from carriers for excess retention.

In a preferred method of the invention, the carrier/container combination of data for each arriving container has been transmitted between the carrier MIS **40**, supplier MIS **50**, and the customer MIS **30**, in the form of an advance shipping notice (ASN) prior to the arrival of the container, so that as the carrier and container are identified and input to the CMCS upon arrival at facility F, and this information transmitted from the CMCS to the customer MIS and/or carrier MIS, the system performs the function of communicating confirmation that a particular container has actually arrived at a destination. Once such confirmation is provided, the system continues to monitor the container about and within the premises of facility F.

Bill of lading information may also be transmitted from the carrier MIS to the customer MIS concerning each container, so that confirmation of arrival of the container (by identifying the carrier and container number only) is sufficient to enable to customer MIS to specifically identify, for example, parts which have arrived on the premises and thus available for assembly. Although it is not necessary for the container monitoring system to know the specific contents of any particular container (as represented by an accompanying bill of lading), it is information which can be readily input to the CMCS (either by the carrier MIS, customer MIS, or through CMCS input terminal **14**) to enable confirmation of delivery of specific contents-identified containers. In other words, data of the contents of any container can be stored and associated with carrier/container identifications within the CMCS as an alternative or addition to the data contents of the customer or supplier MIS.

Shipping rates and cumulative charges associated with bills of lading may also be entered in the CMCS. This data may be correlated with an independent accounts payable program (for example resident in a customer MIS) whereby payments from a customer to a carrier can be authorized by

the data from the CMCS. By this method, payments to carriers are made only for containers/goods which have actually been received or unloaded on the customer's premises. Similarly, carriers can use the delivery confirmation data provided by the system to generate bills to customers with actual confirmation that a particular delivery has been made.

As alternatives to monitoring location and status of specific contents of containers (which is contemplated by the invention), one method of the invention is to monitor the load status of any given container by using designations such as "full" or "truck load", "partial load" or "empty". Load designation conventions can be used such as labeling all incoming containers as "full" in the CMCS (regardless of whether a container is actually full) and all outgoing containers "empty", based upon indications from the customer who is responsible for unloading the container. "Partial loads" are also identified based upon information from the customer that a particular container, only partially unloaded, is to be removed from a dock and returned at a later time. Without the designation of such a container as a "partial load", the customer would have no efficient way of re-locating the container when the remainder of the parts are needed, or of monitoring that the container still had parts in it and should not be allowed to leave the premises until empty. All such load status data is input to the CMCS in the manners described for transmission, by facsimile, electronic mail or through an Internet or world wide web to the customer MIS and carrier MIS. Carriers are thus immediately notified when containers are empty and available for pick-up.

Also monitored by the system is cumulative load data for all incoming and outgoing containers for any particular premises or facility. By tabulating total number of container loads, the system keeps running figures on shipment volume within a premises. This data is then compared to known capacity values to evaluate and/or forecast facility utilization. One example of applicability of this aspect of the invention is to a land fill facility wherein containers are monitored by loads to continuously calculate remaining capacity of a land fill.

Associated with load status and container contents is data on part-carrying racks which fit inside containers. In certain applications of the system, monitoring of racks is equally or even more important than monitoring containers for the reason that certain parts cannot be carried in containers without specially adapted racks. For example, parts such as automobile engines cannot be shipped without empty racks being returned from an automobile assembly plant to an engine plant. Containers which hold such racks are therefore specially identified in the CMCS so that as such containers are completely unloaded, and empty racks placed back in the container, the container is specially identified as, for example, "racks outbound".

A container vehicle V or switcher S drops the container C in a receiving area Y outside or within facility boundaries B. The location of the initial drop off point is confirmed by communication from a remote container data transceiver **18** operated by personnel on the facility premises, such as a shunter driver, for immediate input to the CMCS. This begins the pattern of constant and immediate updating of container location and status by the CMCS to the customer MIS which enables the customer MIS to locate shipments without any searching or delay. The customer provides instructions on which containers are needed at which docks, i.e., switching instructions. Switching instructions may be generated by the customer MIS and delivered to operators of the switchers S or transmitted to the CMCS for communication to switchers S via remote data transceivers **18**. Switching instructions are carried out by operators of switchers S which, in the example of a trucking operation, hook-up to a container such as a trailer and move it from a receiving area to the specified dock. The terms "container" and "trailer" are used synonymously herein. The new location of the container is again reported to the CMCS in the form of a dock or gate number for updating of data on that container in the CMCS database. The amount of time the container remains at the dock is counted in the running retention time clock.

Subsequent container switching instructions received from the facility, for example to remove a container from a dock and return it to a yard, are similarly conveyed and executed by switchers S and reported for updating the CMCS database. The data of course includes the location of the container. Load status of a container is also updated according to information provided by the customer. For example, a container which is partially unloaded and then instructed to be returned to a receiving or holding area is noted in the system as a "partial load". The container is thus readily identifiable when instructed to be returned to continue unloading. In the instance where a single container is switched between a yard and dock or docks multiple times before leaving the premises, the system records each switching operation. This information is useful to the customer to identify excessive switching which indicates production or distribution process inefficiency. Because the system continuously tracks the location and status of all containers on the premises at all times, calculations can be made to determine available capacity for receiving additional containers. This includes calculations for one time deliveries such as to land fills.

Once a container is completely empty and returned to a yard, it is recorded in the CMCS database and reported to the carrier as empty and ready for departure from the premises. In order to communicate all of the data acquired by the CMCS relative to container location and status, including arrival and retention times and load status, the system is able to generate reports of container activity in any desired format for the benefit of all customers and all carriers delivering containers to customers. For example, as represented by FIG. **3**, a "Detail on Hand" report **100** may be generated by the CMCS in any particular format such as columns and rows in which carriers and containers are listed with accompanying status data such as date and time of arrival, yard location and load status. In column I are listed carrier identifications such as SCAT codes for trucks. Column **2** identifies each carrier by full or abbreviated name. Column **3** lists the date of arrival of each container, and in column **4** is listed the time of arrival. In column **5** is listed the dock or docks at which a container is or was last unloaded. And in column **6** the current yard location of each container is listed. In column **7** is noted the status of the container load, which may include notations empty racks such as "racks outbound". Column **8** lists the container number which corresponds to the carrier. And column **9** is provided for entry of load-specific data such as contents identification and quantities and any other load data as may be included on, for example, a master packing list. The load specific data is critical to customers who pay suppliers on a "paid-on-production" system whereby suppliers are paid only upon assembly of parts into a finished product. By knowing that a certain shipment of parts actually arrived at the plant, and that the container left the plant in an empty state, the system provides the customer with independent

verification for authorization of payments to suppliers. The load specific data may further include data on racks in containers. Since a load of racks will have a freight bill identifying the number and type of racks and destination, all of this information can be readily input to the CMCS, and set forth in column **9** of the report, to expedite the return of empty racks to a parts production facility.

The report of FIG. **3** is organized by carrier over a period of calendar days. Other report formats which the system may generate may be according to certain yards or receiving areas, times of arrival, unloading docks, container numbers for certain carriers, or load status. For example, report **120** as depicted in FIG. **4**, is compiled as an "Empty Trailer Report" listing only trailer containers which are completely empty and ready for departure from the premises. This type of report is most valuable to carriers wanting to retrieve containers from the customer's premises as soon as possible. The report is also valuable to the customer for verifying over-retention charges by carriers. In this format, the carrier and containers are identified in column **1**, the unloading dock in column **2**, the current yard location in column **3**, and the initial load type in column **4**. A "packing list" column **5** is provided for entry of specific data on the contents of a container as described above. The figures in column **6** represent a total amount of time a container has been on the premises from the time of arrival to the time the report was generated. And column **7** is provided as a flag field for time measurements in column **6** which indicate containers "past due" for pick up.

FIG. **5** schematically illustrates one processing flow for monitoring containers in accordance with the invention, which steps may preferably be performed by an appropriately programmed computer such as the CMCS. The computer program generates screen displays for presentation on a connected monitor to an operator of the system. The screen displays provide graphical or spread sheet type formats for entry and verification of container data, and control menus for accessing different types of information on containers in the system.

The process begins at step **0**, proceeding to step **100** to determine arrival of a container. Step **200** insures that each arriving container is uniquely identified by the system. FIGS. **6A–6C** are representative of types of screen displays which may be generated by the CMCS computer program for input and display of container information at a CMCS monitor. For example, a screen display such as FIG. **6A** provides a format for a container identification header to be created at step **300**. The header is used as a virtual data envelope by and through which all data relevant to an identified container is accessible, transferable, manipulable. An arrival record is created at step **400**. Step **500** is provided to accommodate containers which must be immediately "spotted" or moved to yard or dock, for example based upon information received from the customer MIS identifying "hot" loads. In lieu of an immediate spot, arriving containers are spotted to a yard at step **600** and the header record updated at step **700** with yard location, which may also include a subdesignation of a parking spot within a yard. FIG. **6B** is a trailer spot update input screen display. At step **1000**, loaded containers are summoned to a receiving dock, based upon instructions received from the customer, the header record for the summoned container located at step **1100** such as by inputting container identification via the input screen display of FIG. **6C**, with intermediate error correction steps **1200** and **1300**, and a container spot or transfer performed and similarly updated to the system at steps **600** and **700**. Containers departing from the premises are monitored at step **1400** which again requires locating the corresponding header record at step **1500** via screen display of FIG. **6C**, with error correction for no data match at steps **1600** and **1700**, the departure of containers input and updated to the system at steps **1800** and **1900**. By performing these steps in connection with the CMCS programmed to follow and prompt users through the sequence, and by controlling the plant entry points and premises, the system maintains accurate records of identification, location and load status of all containers on the premises and the amount of time containers are on the premises.

The invention further provides detailed information on dock usage and availability for a given facility. This information is very valuable to managers of the facility to enable analysis of dock usage, and to schedule incoming loads, particularly "hot" loads or live unloads which proceed from a gate directly to a dock for just-in-time delivery, or to coordinate deliveries to arrive within a scheduled window of time. Dock usage directly correlates to production or warehousing activity within a facility, because each dock is located nearest to an assigned task within the facility. When a particular dock is occupied by a container, it is critical to know which is the next nearest available dock. As shown in FIG. **7A**, the system produces a real-time Dock Availability Report **701** which numerically lists each dock at a facility in columns **702**, followed by carrier and container identification codes in columns **703**. The Report **701** is generated from the data received from drivers or the switching vehicles S on containers dropped at a dock. The report **701** can be displayed within a switching vehicle on radio frequency operated hand held devices or on the display of an on-board computer.

By recording every container drop or move to every dock, the system can further generate various Dock Management Reports as shown in FIGS. **7B–7C**. FIG. **7B** is a Carrier Dock Activity Report **710** which, for a given carrier, such as "LEHM" in field **711** on a given day, such as "**12/04/97**" in field **712**, shows the total number of containers brought to a dock in field **713** and from where they came (e.g., from a yard, from another dock, or direct arrival); total number of containers removed from or left at docks in field **714**, the load status of containers removed from docks in field **715**. The load status may be partial, empty, empty racks or other such as a "live unload". The total number of different types or switches or movements of containers for the day are recorded in field **716**.

As shown in FIG. **7C**, the system further generates a specific dock activity report **720** for a particular dock and a particular carrier. The specific dock is identified in field **721**. An "In Dock Time" field **722** records the date and time of arrival of a container at the dock. An "Exit Dock Time" field **723** records the date and time of departure of the container from the dock. A "Dwell Time" field **724** records the total time in minutes that the container was at the dock. A "Trailer" field **725** records the identification number of the container, which in this example is a trailer. And a "Carrier" field **726** identifies the carrier. Field **727** records the inbound and outbound load status. Field **728** records the identity of the origination and destination yards.

The dock activity report can assist the facility management by appropriate allocations of manpower to docks for unloading and loading operations.

FIG. **7D** is a "live unload" report **730** which records all trailers which were taken directly to docks for unloading upon arrival at a facility. The live unload dock is identified in field **731**. The "In Dock Time" is recorded in field **732**, the

"Exit Dock Time" in field **733**, the "Dwell Time" in field **734**, the "Trailer" or container identifier in field **735**, and "Carrier" identification in field **736**. Report **730** assists the facility management in measuring the performance of carriers and logistics providers, as "live unloads" represent the most efficient delivery scenario in which the cargo arrives at a point or window in time in which it can be accepted directly into the facility.

From the report **720**, a carrier knows exactly when its containers reached a dock and how long each container remained at a dock for unloading, and whether it was completely or partially unloaded. This information is used to compile a bill to the facility owner for over-retention of containers, in excess of an agreed amount of time allotted for unloading. The facility owner uses this report to confirm that bills for over-retention charges are accurate. The facility owner can also use this report to identify inefficiencies in unloading operations or inaccurate timing of just-in-time manufacturing operations. For example, if a particular dock or group of docks are more active than others, or occupied for longer times than others, it may indicate that more workers are needed at those docks to expedite unloading. The daily generation of reports **710** and **720** can be automatically faxed by the system to both carriers and facility management so that appropriate logistics adjustments can be made. Alternatively, both carriers and a facility may access reports from the CMCS by appropriate connection, including via e-mail or the Internet, as described in connection with FIG. **2**.

For managers of a facility where thousands of containers are arriving and departing each month, it is advantageous to have data on trends in container arrival. This information is used to identify delivery windows, or to alter delivery logistics. It is especially useful for timing just-in-time deliveries. FIGS. **8**A and **8**B together are an example of an Arrival Count Report **801** which shows container arrivals by hour for each day of a month. The days of the month are listed in column **802**. The hours for each day are listed in the columns **803** to the right of column **802**. Total container arrivals are set forth on line **804**, and the average number of container arrivals per hour on line **805**. On FIG. **8**B, field **806** sets forth total and average numbers of container arrivals for each day of the week for a specified month. Field **807** sets forth the total number of arrivals per hour, per day of each week for a specified month. And field **808** sets forth in summary form the average number of arrivals per hour, per day of each week for a specified month.

The system also records total number of switches per hour per day, as shown by the "Switch Count Report" **901** in FIG. **9**A. Column **902** lists the days of a specified month. Columns **903** are for each hour of the day, with totals in the far right column **904**. The system operator can use this information to plan for staffing of switching vehicle operators, and to detail billing based on per switch or spot operations. In the "Switch Count Summary Reports", FIG. **9**B, the system total number of switches per day of the week for a selected month in field **905**, and average number of switches per day of the week for a selected month in field **906**. The total number of switches per hour per day of the week is set forth in field **907**, and the average number of switches per day per hour of the week in field **908**.

The system also generates a "Live Unload Exception" report **1001**, shown in FIG. **10**A. Because the system knows from an advanced shipping notice (ASN) that a particular load is intended to be a "live unload", which means that the container is to be delivered directly to a dock without being first switched or placed in a yard or holding area, any contact with such a container by a switcher S of the system automatically records the container status as a "live unload exception". The carrier is identified in field **1002**. The container is identified in field **1003**. The date and time of arrival is identified in field **1004**. The date and time of the "First Move", the time the switcher S contacted the container which triggered its entry into the Live Unload Exception report, is recorded in field **1005**. The number of moves are recorded in field **1006**. This could be several moves before the container is emptied. The date and time of departure is recorded in field **1007**. And the load status is recorded in field **1008**.

For any container which appears on the Live Unload Exception report **1001**, a Detail Page report **1010**, shown in FIG. **10**B is accessible. Field **1011** includes the carrier and container identifier, load status, the fact that it was originally intended to be a live load but resulted in a live unload exception, and the yard location. Field **1012** records the date and time of each of the events in connection with the excepted container, including the date and time of arrival, last move, immediate fax for notification to the carrier or container owner, retained or put into detention, unload, loading or partial loading of racks (commencement of loading), completed reload and departure. Field **1013** provides a running history of container activity including a record of the date, time, yard, dock, type (of load), arrival/departure (A/D).

Just as the information on dock availability is valuable, so is information on utilization of the various yards surrounding a facility. To this end, the system provides a "Slot Availability" reports as shown in FIGS. **11**A–**11**F which provide real-time information on container identification within each (parking) slot in each yard monitored. FIG. **11**A is one graphic form of a yard slot availability report **1101**, wherein various yards are identified in the left side column **1102**, and yard slots across the upper line **1103**. This creates a matrix in which a container location can be identified graphically, by for example the asterisk symbol. The corresponding detailed information on the selected container is displayed below in line **1104**, including the yard name, row and slot designation, carrier and container identification code, and load status.

Alternatively, as shown in FIG. **11**B, a "Yard Selection Screen" **1106** lists yard identifiers in column **1107**, and the yard names in column **1108**. Selection of a yard identifier from column **1107** takes the user to a "Row Selection Screen" **1110** shown in FIG. **11**C. Selection of a row from column **1111** on screen **1110** takes the user to the "Slot Detail Screen" **1112** shown in FIG. **11**D. Within a frame **1113** are designators **1114** for each of the slots (e.g., 1–20) within the selected row. Next to each of the slot designators **1114** are the carrier/container identifiers for the containers present in those slots. This procedure is most useful where the general location of a container is known. When the location of container is to known at all, a search function is provided on each of the screens **1106**, **1110** and **1112**. not example, by pressing F5, the user is taken to a "Find Trailer By Trailer Number" screen **1116** shown in FIG. **11**E. A trailer number is entered and the system switches to a "Trailer Quick Summary Screen" **1118** shown in FIG. **11**F. Field **1120** of screen **1118** displays the load status of the container, the yard location, the row designation within the yard, the slot number within the row, and an identifier (e.g., KKS) of a driver of a switching vehicle which placed the container in that location. The identification of the switching vehicle driver is particularly advantageous to operators of the system, to be able to dispatch the correct driver to retrieve

a container within the driver's assigned yards or rows. The "Trailer Quick Summary Screen" **1118** can also be accessed by selecting a highlighted trailer/container identifier on the "Slot Detail Screen" **1112** of FIG. **11**D. A user can move about the "Slot Detail Screen" **1112** by the use of cursor keys or a mouse.

Containers are commonly tracked in transit by satellites or other electronic signaling and tracking devices. In transit type tracking systems are macro in the sense that they know whether a container is at point A or at point B, or at a location between points A and B, but they do not know the location or load status of a container within point A or point B. Such information is critical to carriers to be able to time deliveries to coordinate with production, to know immediate availability of containers, to know the contents of returning containers such as "racks outbound", and to have enough information to compile a real-time/running accounting of a shipping business as further described below.

The use of radio frequency identification (RFID) tags and readers, as produced for example by SAM^{SYS}, Inc., enables rapid acquisition and updating of container location and status. The equipment typically includes a card or tag on which is encoded carrier and container identification data. Tag or card readers are located at facility boundaries such as gate G, or in yards or at docks to automatically identify containers. This instantaneously loads the container location data into the CMCS **10** (FIG. **2**). Automated container data input can alternatively be accomplished by the use of magnetically encoded cards and readers, or scannable bar code tags.

When the tag or card readers of a group or network of facilities are all electronically linked to the CMCS **10**, a carrier MIS **40** which is linked to the CMCS can obtain a real-time location of every container which has been automatically read into the system. For example, a carrier or supplier connects to the CMCS by private or other connection such as through the World Wide Web. The user enters an ID number to gain access to the system. In one embodiment, the system generates a mapping screen **1200**, shown in FIG. **12**A, which displays a geographic territory which encompasses all or some of the carrier's terminals, and facilities at which containers are monitored. Field **1201** of screen **1200** is a container search input to locate a container at any one of the monitored sites. Once a container number is input, the system progresses to display the site at which the input container is presently located, such as screen **1205** shown in FIG. **12**B, and in field **1206** displays the site location name, arrival date and time, and a request to view a history archive file, which may be displayed such as field **1013** of FIG. **10**B. In other words, it provides an archival history of the specified container at the specified site, i.e., when it arrived, how many switch moves have been made, how many and which docks it has been at, and the load status between each switch move and the current load status.

The system uses a similar approach to perform container audits of selected facility or terminal sites. For example, as shown in FIG. **12**C, a site display screen **1208** geographically displays each of the facility and/or terminal sites monitored by the system, and includes a site or terminal search field **1209**. When the name of site is entered, the system progresses to screen **1210** shown in FIG. **12**D, which displays in field **1212** a listing of all containers present at the selected site. A particular container can be selected from field **1212** for detailed archival data on that container in a form, for example, such as field **1013** of FIG. **10**B. One item information which may be included in this field for any particular container is a note or comment on the maintenance status of a container. Since the switching vehicle operators and loaders/unloaders of the container have ample opportunity to inspect each container handled, they can input any observed damage or maintenance requirement into a comment field in the container status. This enables a rolling maintenance program whereby a carrier can plan for delivery of a container to a maintenance facility based upon a known repair need. Of course, the container and site data can be alternatively displayed in different formats which may not include a graphical representation.

With the described real-time data on container location and load status acquired by the system, a user such as a carrier or supplier has enough information to derive a virtual inventory at each stage of a supply chain. As described with reference to FIGS. **13**A–**13**D, the supply chain logistics tracking starts with a customer or consignee release of a product/part order at step **1301** in FIG. **13**A. The supplier makes an internal check of inventory at step **1302**, and goes to production steps **1303** and **1304** if production is required in order to establish supplier inventory at step **1305**. A "Supplier" as identified in the boxes, may be either the original manufacturer of the goods specified in the release order at step **1301** or a distributor who physically receives goods from a manufacturer or represents a manufacturer as a sales agent and processes orders for the manufacturer. The supplier pulls product from inventory at step **1306** and loads it on a conveyance at step **1307**.

An important piece of inherent data is created at this point with respect to shipping racks. As known in the industry, the term "racks" refers to any type of packaging or support device which holds a part or multiple parts for secure shipment within a container. A rack may be something as simple as a carton, box or pallet, or a complex steel structure which supports an engine or other subassembly of a product. In most instances, products cannot be shipped without a specific corresponding rack.

The type and number of parts loaded for conveyance will indicate the type and number of racks required to be on the shipping container. Similarly, the number of parts can be calculated from part size, pallet size, box or carton size, whether the pallets, boxes, cartons are stackable, and the size of the container in which the parts are being carried. All such data may be resident in the CMCS database **12** (FIG. **2**).

At step **1308** on FIG. **13**B, the supplier generates an advanced shipping notice (ASN) for transmission to the customer. The ASN includes the part number, supplier code, release order, purchase order number, quantity shipped, destination and estimated time of arrival (ETA) at the consignee's or customer's facility. When the carrier departs from the supplier at step **1309** the shipment is noted as "in transit" at step **1310**. The ASN is electronically transferred to the consignee/customer at step **1311**. The ASN is loaded into a virtual inventory database **13** in the CMCS (FIG. **2**) at step **1312**. Additional data resident in the virtual inventory database may include the location of the supplier and the a calculated ETA based on that location, associated carriers and type or size of containers, and rack information. This data may be redundant, related or in addition to the data supplied by the ASN. The inventory is "virtual" in the sense that the CMCS knows that it is scheduled to become inventory prior to its physical arrival, as a result of receipt of the advance shipping notice (ASN). When the shipment physically arrives at the site at step **1314**, the recording of the carrier and container ID as described above creates a "virtual inventory" record at step **1315**. This inventory is "virtual" in the sense that although it is physically at a facility, i.e., in a container which is sitting in a yard or on a

pier next to a building which is the assembly or transfer site, it is "near" inventory because it is not inside the building, or grouped together with like parts in a storage or assembly line spot, but is nonetheless accounted for by the system.

The physical arrival of a container at step **1314** is entered into the CMCS at step **1316** (FIG. **13**C). By matching the conveyance arrival data (carrier and container ID) with the ASN data received from the carrier, the CMCS performs a system-to-system audit verification at step **1317**, and is able to notify the customer/consignee of any discrepancies at step **1318**. A carrier may query the CMCS virtual inventory **13** at step **1319** by entering the ASN data for a particular shipment. This prompts the system to search the virtual inventory ASN files for product match at step **1320**, and to generate a conveyance report at step **1321** based upon accurate matches of ASN/virtual inventory data. Simultaneously, at step **1322**, multiple conveyance product matches are converted to total product so that the consignee can be alerted to overstock and/or overshipment of product, and thereby reduce further purchase order or release from a blanket purchase order.

When the conveyance or container is unloaded at step **1323** (FIG. **13**D) it becomes consignee/customer "in facility" inventory at step **1324**. The unloading is noted by the switching operations described above. The system then purges the corresponding ASN once the container is noted as (fully) unloaded or reload status at step **1325**. With the shipment completed, the system is able to produce a conveyance life cycle report at step **1326**, and record the report in an archive at step **1327**.

The advantage of the described virtual inventory aspect of the system is that it provides real-time data on all inventory regardless of its location, i.e., in transit, at a facility, or in a facility. This is the only way to keep an accurate accounting of the total real time value of the supplier's, carrier's, business, and customer's businesses. The virtual inventory aspect of the invention is thus a method to assist a customer's management in inventory control. The customer can "view" all inventory(whether physically in stock or not) less all inventory committed to production or delivery as "real inventory". Customer savings are realized from inventory reductions (i.e., a reduction of carrying costs including interest, insurance and taxes), the possible elimination of offsite storage facilities, or the need to rent or build additional space, potential reduction in required warehouse space and the associated costs, and avoidance of safety issues involved with warehousing of excess inventory, including insurance, worker's compensation and related litigation.

The ordinary payment procedure of customers, such as automobile manufacturers, is to pay for parts delivered only upon proof of receipt. The proof of receipt is ordinarily a bill of lading which accompanies the shipment. A bill of lading is a receipt which a carrier gives to a supplier/shipper for goods given to the carrier for delivery. The bill of lading evidences the contract between the shipper/supplier and the carrier, and can also serve as a document of title creating in the person possessing the bill ownership of the goods shipped. The bill of lading is ordinarily presented to the customer upon delivery of the shipment by the carrier. This procedure is complicated by the following circumstances, a) where the container is left at the customer's yard for some period of time before it is unloaded, b) where the customer and supplier agree that payment for the goods will not be made until the goods are unloaded (completely) into the customer's facility, or c) where the carrier must return the container with racks which belong to the customer or the supplier. Of particular importance is the information on "racks outbound" (RO) from a facility, as this impacts directly on the future flow of parts to the facility.

Complex paper-based systems have been devised to confirm receipt and unloading of goods, and reloading of racks (correct in number and type) into returning containers. However, any misplacement or oversight of any of the documents required to record the each of the necessary actions to be taken with any given container corrupts the system and ultimately results in a) a loss in inventory to the customer, or b) substantial extra expense to the supplier to correct errors in rack returns. A supplier is just as interested in receiving back the correct type and number of racks as is the customer in receiving the correct type and number of parts. For without the correct racks, a supplier can deliver no more parts.

The present invention provides an improved method and system for verifying and document accurate rack return without total reliance on a multiple copy paper chain. As described with reference to FIGS. **14**A–**14**C, at step **1401** a facility worker such as a lift driver reloads an emptied container such as a trailer with returnable racks. A rack return reload sheet (RRRS) is filled out at step **1402**. The rack return reload sheet is based on MMDT and a rack ID matrix acquired at step **1403**, and a dock number, SCAC code, trailer number, rack identifier and quantity acquired at step **1404**. The rack reload sheet is faxed to the facility gate G (FIG. **2**) at step **1405** for entry into the CMCS database at step **1406** and verified at step **1407**. The rack return reload sheet data is also fed to the customer MIS **12** at step **1408** and "booked" for payment at step **1409**. The data from the rack return reload sheet is loaded into the CMCS at step **1410**. The CMCS then matches the data to the MMDT rack ID matrix data resident in the database at step **1411**. If this information matches then the system produces an electronic bill (of lading) at step **1412** for matching with the corresponding container as it leaves the facility boundaries through the gate. This electronic bill of lading is also transferred to the customer MIS **30** or **60** at step **1413** to provide that system with the latest rack return data. Rather than relying on the carrier's bill of lading and rack return information, the system has generated a bill based upon information received from the person who reloaded the container with empty racks, and cross-checked that information with the MMDT and rack ID data.

With reference to FIG. **14**B, as a rack-carrying container arrives at the facility gate, the container number is entered into the system (manually or automatically) at step **1414**. The system notifies the operator at step **1415** that the container is "racks outbound" and asks if an outbound billing memo (i.e., a bill of lading) is to be printed. If the billing memo is requested at step **1416**, the system, knowing the return destination of the racks, automatically calculates at step **1417** an estimated time of arrival (ETA) based upon data on mileage, average speed, DOT regulations, supplier business hours, plus an "X" hours buffer time. All of this information is calculated from data resident in the CMCS database. The request for an outbound billing memo at step **1415** updates the container to "depart" status at step **1418**, and the billing memo data is automatically faxed to the carrier at step **1419**, and to the supplier at step **1420**, with the calculated ETA. A hard copy of the billing memo is printed at the gate at step **1421** and handed to the carrier driver at step **1422**. The container departs at step **1423**, and the customer's record of rack return is updated with the actual time and date of departure at step **1424**.

As shown in FIG. **14**C, the detailed tracking of rack returns continues all the way back to the supplier. If the

carrier driver meets the calculated ETA, at step **1425**, the supplier "arrives" the container at step **1428** by notifying the CMCS, electronically or by telephone. If the container does not arrive at the supplier within the ETA, the carrier driver notifies the supplier at step **1426** of the delay, and the supplier adjusts the container ETA in the CMCS at step **1427**. If the container does arrive on time (step **1428**) the CMCS is notified at step **1429** and the record is archived. The customer rack return record is updated by the CMCS at step **1430**. The record at step **1429** is the completion of a delivery transaction from the supplier's perspective, as the timely return of the racks is an absolute prerequisite to future shipments.

To confirm that the correct type and number of racks have been returned in the arrived container, the container contents is physically matched against the record of the billing memo (generated at step **1421** in FIG. **14**B) at step **1431**. If there is a discrepancy, the supplier posts the discrepancy to the CMCS at step **1432**, the CMCS database is updated at step **1433**, and the customer's rack return records at step **1434**. If the container contents match the billing memo, the rack return transaction is both completed and verified, at which point the entire record can be purged from the CMCS at step **1435**.

In one further aspect of the invention, described with reference to FIG. **15**, a method and system for timed, sequential parts delivery to a manufacturing facility is provided. In the mass assembly of complex products such as automobiles, thousands of parts are needed at certain times and locations within a facility. The quantity and timing of parts requirements is set by the manufacturer, for example by a weekly schedule. Timed delivery of relatively large parts, such as engines and body panels, directly from a supplier to the manufacturing facility is accomplished through the described use of ASNs and container monitoring within the facility receiving yards. However, for small parts such as fasteners (also generically referred to as "standard parts"), this approach is not practical. Small parts are therefore typically shipped in bulk quantities which exceed present production requirements and are therefore simply held within the manufacturing facility. This commonly results in substantial losses of excess small parts waiting for assembly. In one particular industry, this "holding" of parts and the resultant losses is estimated to add 15% to the total cost of the parts.

The present invention eliminates the asynchronous delivery of small parts to a manufacturing facility relative to current production by providing a metered warehouse from which small parts are distributed to the manufacturing facility in quantities which correspond to current (daily and weekly) production. As shown in FIG. **15**, a metering warehouse **1500** receives parts from standard parts manufacturers **1502** delivered by carriers **1504**. The carriers **1504** used by the system are preferably closely affiliated with the manufacturers of the standard parts, with establish "most efficient routes" from the manufacturers **1502** to the warehouse **1500**. The warehouse **1500** is preferably in relatively close proximity to a manufacturing facility **1506** where the standard parts will be assembled into a finished product or component.

The warehouse **1500** may have on hand a minimum quantity of standard parts for manufacture of a certain product, based on current trends in manufacturing pace and capacity. Many warehouses are operated under inventory management programs which adjust inventory based upon projected requirements. Although such systems reduce overstocking of parts, they do not address the manufacturer's problem that arises from the delivery of a minimum quantity, such as a carton, to the facility, when only one box of parts from the carton will be used in the day's or week's production. The losses to the manufacturer occur with the parts remaining in the carton, awaiting assembly.

In the present invention, when the warehouse **1500** receives a build order from the manufacturing facility, specifying the exact number of parts required for a production run. A "metered" load **1508** is assembled at the warehouse and delivered to the facility **1506** by metered parts conveyance **1510**. The metered load may include an exact quantity of parts required for production for a single or multiple shifts, one day, several days, a week or several weeks or more. Records of the metered load are matched to the build orders. Within the manufacturing assembly there are assembly zones, e.g., Zone A, Zone B, Zone C, etc. The metered load **1508** is loaded onto the parts conveyance **1510** according to a sequence in which the zones at the facility will be reached. This aspect of the system is critical in connection with a manufacturing facility which may be many acres in size, with substantial distances between drop-off points (docks) to the different zones. The load **1508** is dropped at the designated zones in sequence. The timing of the metered load delivery can be matched to a production schedule to accomplish just-in-time delivery. The deliveries are communicated to the manufacturing facility, e.g. through the CMCS, so that the facility has a running record of parts on hand. Each of the zones is then audited periodically to verify that the current zone parts inventory corresponds with completed production runs.

The invention has been described in terms of certain preferred and alternate embodiments which are representative of only some of the various ways in which the basic concepts of the invention may be implemented. Certain modifications or variations on the implementation of the inventive concepts which may occur to those of ordinary skill in the art are within the scope of the invention and equivalents, as defined by the accompanying claims.

What is claimed is:

1. A computerized system for monitoring and recording location and load status of shipping containers relative to a facility with an associated yard defined by a boundary within which containers are to be monitored by the system, and a controlled entry point to the boundary, the system comprising:

means for recording identification codes of containers which enter the boundary,

means for communicating and recording information on movements, location and load status of containers within the boundary in response to movement and changes in location and load status of containers made according to instructions received from the facility,

means for generating reports of recorded information on locations and load status of containers within the boundary, and

means for generating reports on container locations and load status relative to designated docks associated with a facility.

2. The system of claim **1** wherein the reports on container locations and load status relative to designated docks associated with a facility are presented as dock availability reports which list a plurality of dock designations and an identification code of a container associated with a designated dock.

3. The system of claim **1** wherein movements of containers within the boundary are recorded in the form of a carrier

dock activity report which displays a number of containers located at a dock of a facility during a designated day, a starting point of a container prior to arriving at a dock, a load status of the container as it was removed from a dock, and a number of switches of container during the designated day.

4. The system of claim **1** wherein movements of containers within the boundary are recorded in the form of a dock activity report which for a designated dock on a designated day records an identity of a container brought to the dock, an inbound load status of the container and an outbound load status of the container, an in dock time and an exit dock time, and a dock dwell time.

5. The system of claim **1** wherein movements of containers within the boundary are recorded in the form of a live unload report which records the date, time, dwell time and identification of containers which move from an entry point of the boundary to a dock.

6. The system of claim **1** wherein movements of containers within a boundary are recorded in the form of an arrival count report which records a total number of containers arrived to a facility per a specified time period.

7. The system of claim **6** wherein the arrival count report records a total number of containers arrived to a facility per day.

8. The system of claim **6** wherein the arrival count report records an average number of containers arrived to a facility per day.

9. The system of claim **6** wherein the arrival count report records a total number of containers arrived to a facility per hour.

10. The system of claim **6** wherein the arrival count report records an average number of containers arrived to a facility per hour.

11. The system of claim **6** wherein the arrival count report records an average number of containers arrived to a facility per hour per a twenty-four hour period.

12. The system of claim **1** wherein the arrival count report records a total number of containers arrived to a facility per hour per day.

13. The system of claim **1** wherein the arrival count report records an average number of containers arrived to a facility per hour per day.

14. The system of claim **1** wherein movements of containers within a boundary are recorded in the form of a switch count report which records a total number of container switches per a specified period of time.

15. The system of claim **14** wherein the switch count report includes a total number of switches per day.

16. The system of claim **14** wherein the switch count report includes an average number of switches per day.

17. The system of claim **14** wherein the switch count report includes an total number of switches per hour per day.

18. The system of claim **14** wherein the switch count report includes an average number of switches per hour per day.

19. The system of claim **1** wherein movements of containers within a boundary are recorded in the form of a live unload exception report which records a container identification, date and time of arrival, date and time of first move, number of moves, date and time of departure, and load status.

20. The system of claim **19** wherein the live unload exception report further comprises a detail page report which includes an archival history of switching and load status of a designated container.

21. A method for using a computer to monitor usage of one or more docks associated with a facility, wherein the usage involves the presence or absence of a container at a dock, the method of comprising the steps of:

(a) recording the presence of an identified container at a particular identified dock,

(b) recording the absence of an identified container at a particular identified dock,

(c) producing a report which identifies monitored docks and identifies containers present at identified docks, and also identifies docks at which a container is absent.

22. The method of claim **21** further comprising the step of producing a dock availability report which numerically lists one or more docks of a facility and identifies a container present at the identified docks and a carrier associated with the identified containers.

23. The method of claim **21** further comprising the steps of producing a report for a selected dock which indicates a total number of containers brought to the selected dock during a specified time period.

24. The method of claim **21** further comprising the step of producing a report for a selected dock which indicates a total number of containers removed from the selected dock during a specified time period.

25. The method of claim **21** further comprising the step of producing a report for selected docks which indicates a total number of containers left at the selected docks during a specified time period.

26. The method of claim **21** further comprising the step of producing a report which indicates a load status of containers removed from identified docks.

27. The method of claim **26** wherein the load status is selected from the group consisting of partial load, empty load, empty racks, and live unload.

28. The method of claim **21** further comprising the step of producing a report which indicates a total number of switches for an identified container before or after the container is brought to an identified dock.

29. The method of claim **21** further comprising the step of producing a dock activity report for a particular dock which indicates the date and time of arrival of an identified container at the dock, the date and time of departure of the container from the dock, and a total time the container was at the dock.

30. The method of claim **29** wherein the dock activity report further includes the identity of a yard from which the identified container was moved to the dock, and the identity of a yard to which the container was moved from the dock.

31. The method of claim **21** wherein the report produced is a live unload report which identifies containers which are taken directly to an identified dock upon arrival at a facility and which further indicates an IN DOCK TIME, an EXIT DOCK TIME and a DWELL TIME.

32. A method of generating a live unload exception report for monitoring containers intended to be unloaded at a dock of a facility upon arrival at the facility without being first placed in a yard associated with the facility, but which were switched at least once before arriving at a dock, the method comprising the steps of:

(a) identifying live unload containers from information received by an advance shipping notice,

(b) recording a date and time of arrival of an identified live unload container,

(c) recording a date and time of contact with the live unload container by a switcher which flags the container as a live unload exception, and

(d) recording a total number of switches of the container before the container arrives at a dock.

33. The method of claim **32** further comprising the steps of recording the date and time of departure and load status of a live unload exception container.

34. The method of claim **32** further comprising the step of recording for the live unload exception report for an identified carrier and container at least one of the items selected from the group of: load status, yard location, date and time of switches, arrival, last move, retention/detention, unload, loading or partial unloading of racks, completed reload, or departure.

35. A method of monitoring receiving yards for shipping containers with respect to the presence and location of containers within a yard having a plurality of slots wherein each slot is adapted to hold at least one container, the method comprising the steps of providing a graphical representation of a receiving yard including identified slots within the yard and identifying one or more containers associated with the identified slots, whereby location of containers within a yard can be determined.

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United States Patent [19]

Radican

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[54] **CONTAINER MONITORING SYSTEM AND METHOD**

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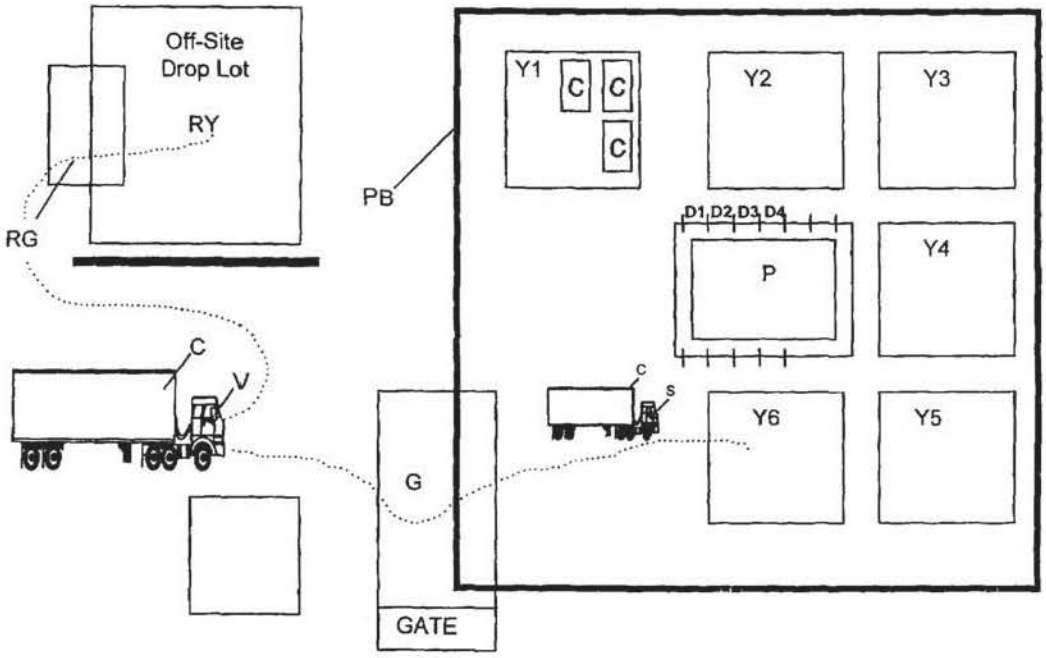
[57] **ABSTRACT**

A container monitoring system and method tracks location and load status of shipping containers within a defined premises and generates container status reports for customers receiving containers, suppliers or shippers of goods, and container carriers. Carrier and container identifiers are used to track and monitor movements and status of each container from a point of departure to a final destination and return. A combined computer and telecommunications system is also disclosed for executing the tasks of the container monitoring system.

19 Claims, 8 Drawing Sheets



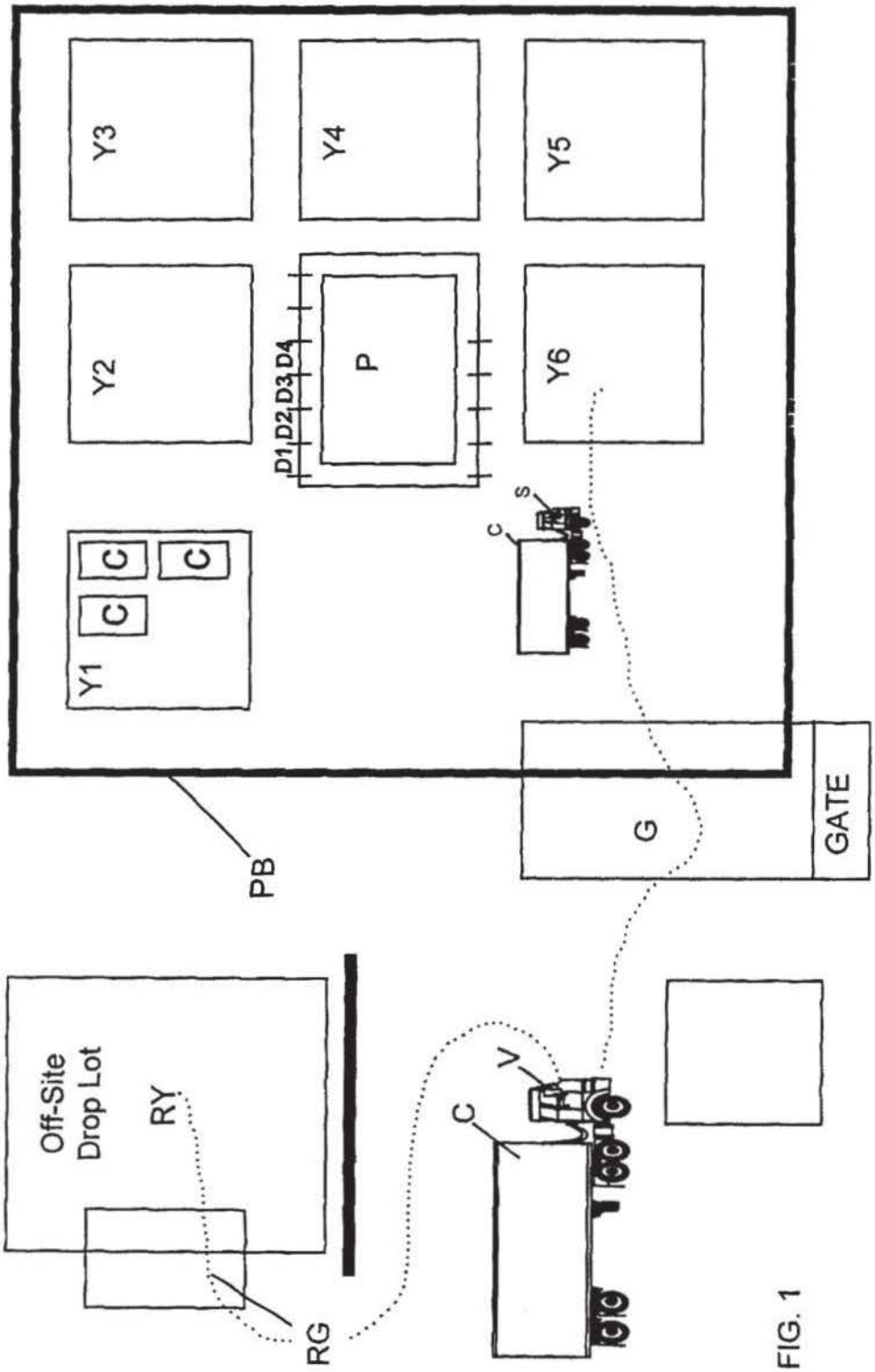

Y3
Y4
Y5
Y2
P
Y6
D1 D2 D3 D4
C
C
C
C
Y1
S
C
PB
G
GATE
Off-Site
Drop Lot
RY
RG
V
C

FIG. 1

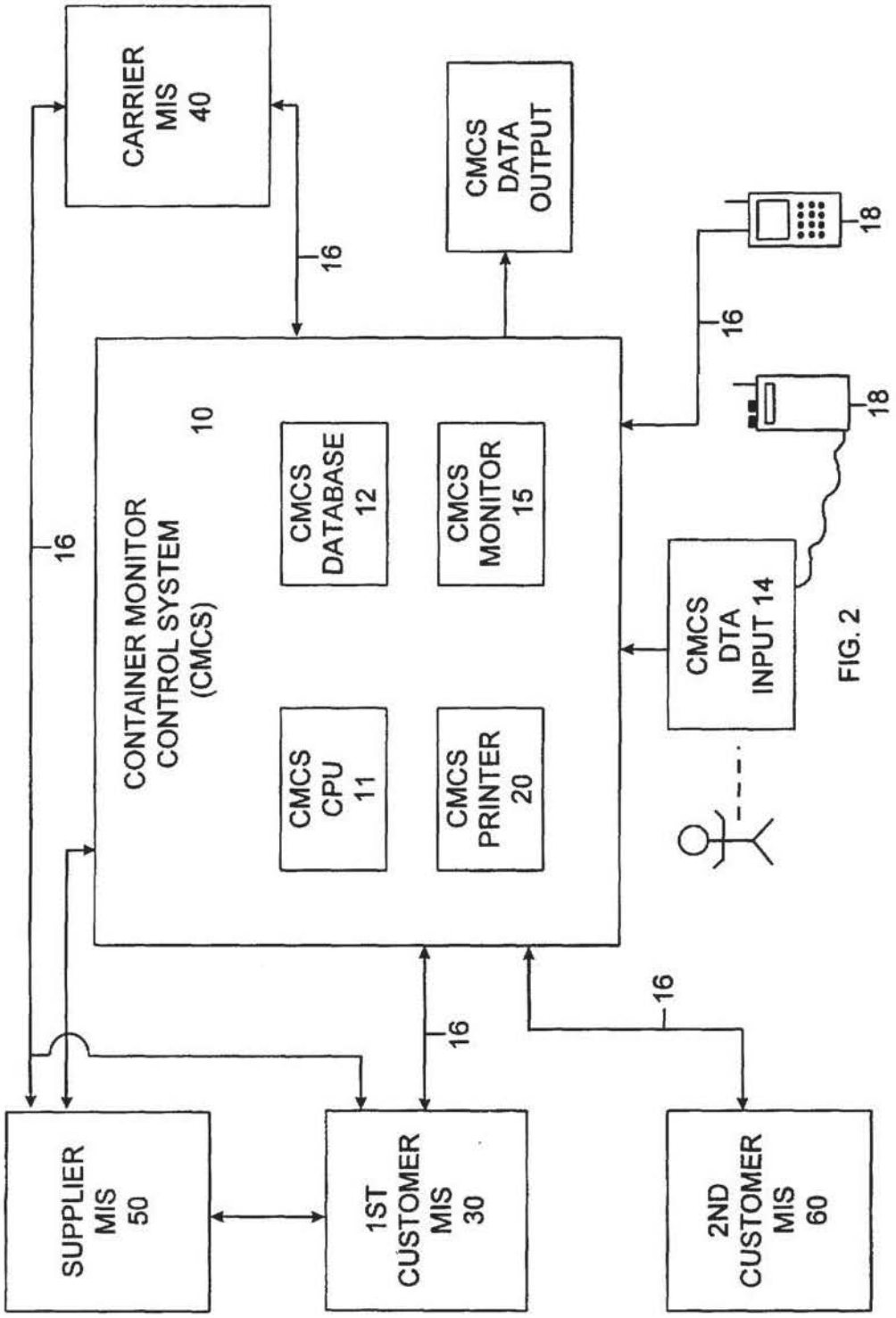

CARRIER MIS 40
CMCS DATA OUTPUT
16
18
CONTAINER MONITOR CONTROL SYSTEM (CMCS)
10
CMCS DATABASE 12
CMCS MONITOR 15
CMCS CPU 11
CMCS PRINTER 20
CMCS DTA INPUT 14
SUPPLIER MIS 50
1ST CUSTOMER MIS 30
2ND CUSTOMER MIS 60

FIG. 2

DETAIL ON HAND

CARRIER	CARRIER NAME	DATE	TIME	DOCK	YARD	STATUS	TRAILER	PACKING LIST
ADXR	A.D. TRANSPORT	06/26/95	09:39		N	EMPTY	16504	
ADXR	A.D. TRANSPORT	06/26/95	08:46		N	EMPTY	92018	
ADXR	A.D. TRANSPORT	06/22/95	13:21		N	TRUCK LOAD	92020	
BGTH	BIG THREE EXPEDITERS	06/21/95	01:51		N	PARTIAL LOAD	482417	
CAAY	C & A TRANSPORTATION	06/26/95	02:55		N	TRUCK LOAD	1916	
CAAY	C & A TRANSPORTATION	06/26/95	17:48		N	TRUCK LOAD	1939	
CAAY	C & A TRANSPORTATION	06/26/95	02:57		N	TRUCK LOAD	1945	
CAAY	C & A TRANSPORTATION	06/26/95	16:54		N	TRUCK LOAD	1946	
CAAY	C & A TRANSPORTATION	06/26/95	02:57		N	TRUCK LOAD	1949	
CAAY	C & A TRANSPORTATION	06/20/95	19:32		N	RACKS OUTBOUND	1950	
CAAY	C & A TRANSPORTATION	06/26/95	02:56		N	TRUCK LOAD	1951	
CAAY	C & A TRANSPORTATION	06/23/95	19:14		N	TRUCK LOAD	1952	
CAAY	C & A TRANSPORTATION	06/27/95	02:54		N	RACKS OUTBOUND	1954	
CAAY	C & A TRANSPORTATION	06/26/95	21:06		N	TRUCK LOAD	1955	
CAAY	C & A TRANSPORTATION	06/27/95	03:57		N	RACKS OUTBOUND	5308	
CAAY	C & A TRANSPORTATION	06/26/95	10:33	38	N		5309	
CAAY	C & A TRANSPORTATION	06/27/95	03:17	37	N		5318	

FIG. 3

EMPTY TRAILER REPORT
UNNOTIFIED CARRIERS

CARRIER	CARRIER NAME	TRAILER	DOCK	YARD	STATUS	PACKING LIST	RETENTION HOURS	
ADXR	A.D. TRANSPORT	92020		N	TRUCK LOAD		115	*PAST DUE*
BGTH	BIG THREE EXPEDITERS	482417		N	PARTIAL LOAD		451	*PAST DUE*
CAAY	C & A TRANSPORTATION	1916		N	TRUCK LOAD		30	*PAST DUE*
		1939		N	TRUCK LOAD		15	*PAST DUE*
		1945		N	TRUCK LOAD		30	*PAST DUE*
		1946		N	TRUCK LOAD		16	*PAST DUE*
		1949		N	TRUCK LOAD		30	*PAST DUE*
		1951		N	TRUCK LOAD		30	*PAST DUE*
		1952		N	TRUCK LOAD		85	*PAST DUE*
		1955		N	TRUCK LOAD		11	*PAST DUE*
		5309	38		TRUCK LOAD		30	*PAST DUE*
		5318	37		TRUCK LOAD		30	*PAST DUE*
		5325	32		TRUCK LOAD		12	*PAST DUE*
		5332		N	TRUCK LOAD		10	*PAST DUE*
		700		N	TRUCK LOAD		13	*PAST DUE*
CIEG	CIMARRON EXPRESS	48383		N	TRUCK LOAD		16	*PAST DUE*
		485903		N	TRUCK LOAD		25	*PAST DUE*
		534611		N	TRUCK LOAD		2	*PAST DUE*
		538355		N	TRUCK LOAD		2	*PAST DUE*
		851589		N	TRUCK LOAD		86	*PAST DUE*
		851659	56		TRUCK LOAD		13	*PAST DUE*
		851765		N	TRUCK LOAD		18	*PAST DUE*
CRBR	CREECH BROTHERS	53151	62		PARTIAL LOAD		27	*PAST DUE*
		5321		W	TRUCK LOAD		8	*PAST DUE*
		53211		N	TRUCK LOAD		20	*PAST DUE*
		53260		S	TRUCK LOAD		28	*PAST DUE*
		53281	22		TRUCK LOAD		24	*PAST DUE*
		53331		S	TRUCK LOAD		1	*PAST DUE*
CUIT	CUSTOMIZED TRANSPORTATION INC.	0519	3		TRUCK LOAD		10	*PAST DUE*
		0520	59		TRUCK LOAD		8	*PAST DUE*
		0522		N	TRUCK LOAD		8	*PAST DUE*
		0541		N	TRUCK LOAD		4	*PAST DUE*
		0547	18		TRUCK LOAD		90	*PAST DUE*
		0582		S	PARTIAL LOAD		26	*PAST DUE*
		0603		N	TRUCK LOAD		7	*PAST DUE*
		100138	20		TRUCK LOAD		19	*PAST DUE*
		100154		N	TRUCK LOAD		23	*PAST DUE*
		100242		N	TRUCK LOAD		19	*PAST DUE*
		100281		N	TRUCK LOAD		8	*PAST DUE*

FIG. 4

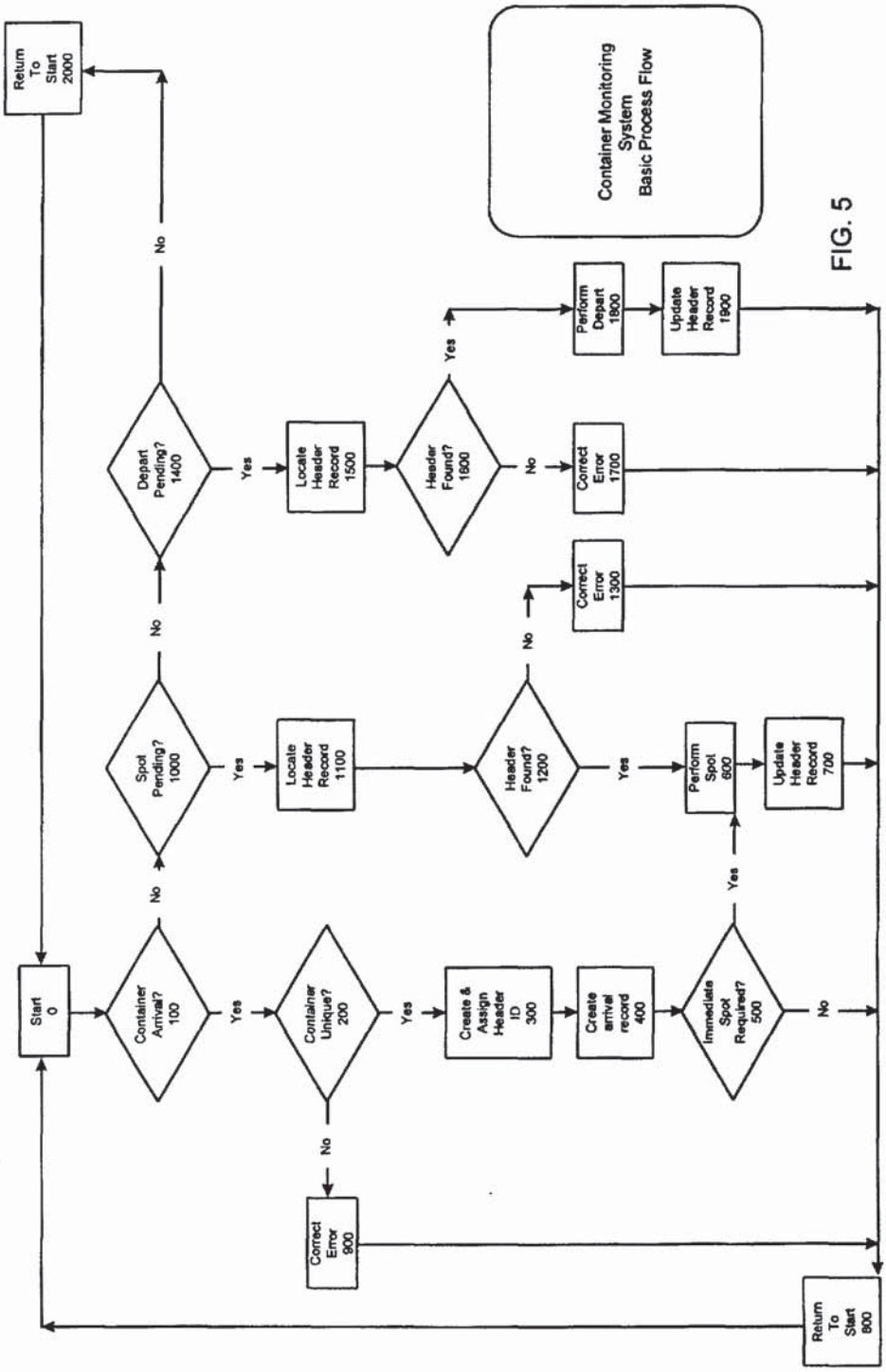

Container Monitoring System Basic Process Flow
Start 0
Container Arrival? 100
Container Unique? 200
Create & Assign Header ID 300
Create arrival record 400
Immediate Spot Required? 500
Perform Spot 600
Update Header Record 700
Spot Pending? 1000
Locate Header Record 1100
Header Found? 1200
Correct Error 1300
Depart Pending? 1400
Locate Header Record 1500
Header Found? 1600
Correct Error 1700
Perform Depart 1800
Update Header Record 1900
Correct Error 900
Return To Start 800
Return To Start 2000
Yes
No

FIG. 5

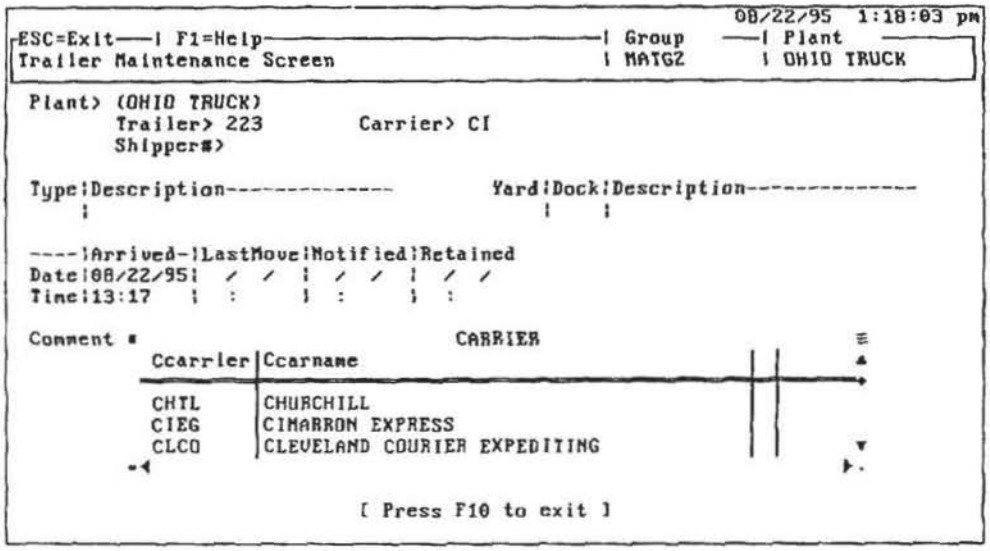
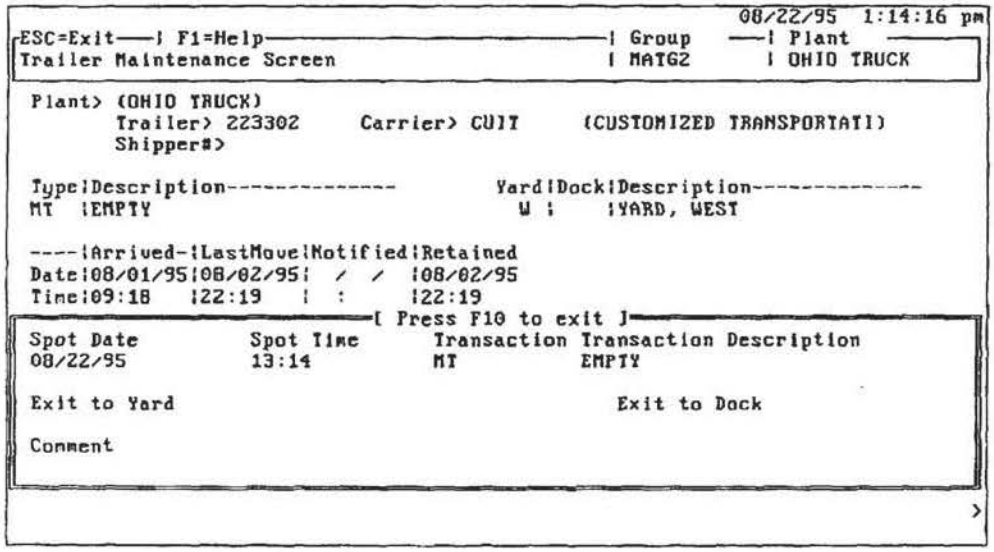

08/22/95 1:18:03 pm
ESC=Exit
F1=Help
Group
MATGZ
Plant
OHIO TRUCK
Trailer Maintenance Screen
Plant> (OHIO TRUCK)
Trailer> 223
Carrier> CI
Shipper#>
Type
Description
Yard
Dock
Description
Arrived
LastMove
Notified
Retained
Date
08/22/95
Time
13:17
Comment #
CARRIER
Ccarrier
Ccarname
CHTL
CHURCHILL
CIEG
CIMARRON EXPRESS
CLCO
CLEVELAND COURIER EXPEDITING
[Press F10 to exit]

FIGURE 6A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F1=Help
Group
MATG2
Plant
OHIO TRUCK
Trailer Maintenance Screen
Plant> (OHIO TRUCK)
Trailer> 223302
Carrier> CUIT
(CUSTOMIZED TRANSPORTATI)
Shipper#>
Type|Description
Yard|Dock|Description
MT |EMPTY
W |
|YARD, WEST
----|Arrived-|LastMove|Notified|Retained
Date|08/01/95|08/02/95| / / |08/02/95
Time|09:18 |22:19 | : |22:19
[Press F10 to exit]
Spot Date
Spot Time
Transaction
Transaction Description
08/22/95
13:14
MT
EMPTY
Exit to Yard
Exit to Dock
Comment

FIGURE 6B

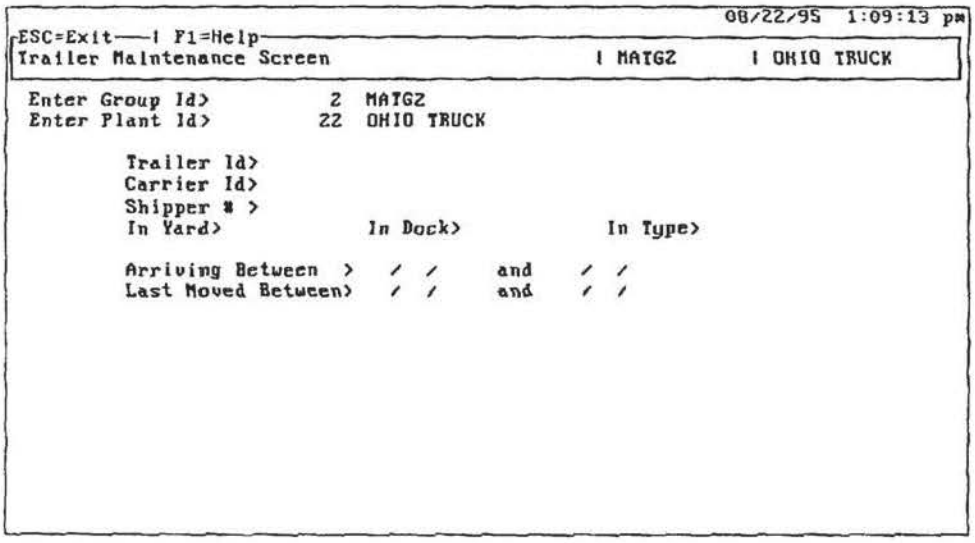
08/22/95 1:09:13 pm
ESC=Exit F1=Help
Trailer Maintenance Screen
MATGZ
OHIO TRUCK
Enter Group Id> 2 MATGZ
Enter Plant Id> 22 OHIO TRUCK
Trailer Id>
Carrier Id>
Shipper # >
In Yard>
In Dock>
In Type>
Arriving Between > / / and / /
Last Moved Between> / / and / /

FIGURE 6C

CONTAINER MONITORING SYSTEM AND METHOD

FIELD OF THE INVENTION

The present invention pertains generally to systems and methods for data acquisition and information management and, more particularly, to data acquisition and information management systems for tracking the location and status of moveable objects.

BACKGROUND OF THE INVENTION

Information is critical to every business. Businesses can increase efficiency and profitability by acquiring and making use of greater amounts of information. In highly dynamic businesses such as shipping and continuous assembly manufacturing, the value of information is inversely proportional to the age of the information. With the advent of the computer, information acquisition, management and usage has dramatically improved in all areas of human activity. In many areas, potentially valuable information which is readily available is not gathered and used to the extent possible, simply because no one has devised ways to acquire, manage and use such information.

Modern manufacturing procedures require product assembly parts to arrive just-in-time at assembly facilities to reduce or eliminate parts inventories. This requires discrete tracking of loads and parts arriving at a manufacturing facility, and of part-carrying racks leaving the manufacturing facility, all within different types of shipping containers. Despite the many improvements in internal manufacturing efficiency, the critical parts supply delivery system has not been improved much beyond simply dropping a shipment at the door of a factory. This approach leaves production management personnel with the task of locating shipments and parts outside of the factory to coordinate final delivery of a shipment at a very specific location (dock or entry door) to a plant. In common shipping practice, receivers of goods carried by containers have only a bill of lading as a record of arrival of the goods at a destination. Even when the information from the bill of lading is recorded or otherwise transferred within an organization, the physical location of the goods identified by the bill of lading is not generally known or tracked or monitored once the container leaves the point of entry onto plant premises. This practice leads to the difficulty of locating shipments and parts which are located on the premises of a manufacturing or assembly facility but without any information other than that the shipment has arrived.

SUMMARY OF THE PRESENT INVENTION

The present invention overcomes these and other difficulties of container monitoring and of methods and systems of the prior art used to collect and manage shipping and container information. The present invention provides a container monitoring system which is an all-encompassing tracking system capable of tracking any identifiable container from a point of departure to a point of destination and return, or to a subsequent destination. The system and method of the invention provides real time data on container identification, location and load status. In one embodiment of the invention, the container monitoring system provides a computerized container tracking system which, with proper communication between suppliers, provides the interactive parties of suppliers, shippers, carriers and customers with twenty-four hour live data on container location status including but not limited to: country, state, county, city, address, specific location within an address, aisle at a specific address, slot or space number in a specific aisle, ocean, lake, river, port of entry, railroad terminal, airport, airport gate, etc.

In addition to container location status, the container monitoring system provides twenty-four hour live information to all interactive parties on the load status of containers such as "full", "partial load" or "empty". In accordance with the invention, this information can be used to automatically create schedules for container retrieval from delivery sites. With appropriate container and shipper identification, the container monitoring system of the invention accumulates, segregates and itemizes in reports amounts due shippers based upon data acquired, processed and stored by the system. The system uses this information, in combination with an accounts payable program to authorize payments to shipping companies with all necessary shipping data associated with each payment.

The container monitor system of the invention further has the ability to provide quantity controls and projections of capacity status for storage areas for containers. The system can forecast and prevent container capacity problems for particular storage or receiving areas based on information of expected delivery dates of containers. The system thus provides information necessary to allow customers, shippers and carriers to adjust respective scheduling in order to avoid insufficient capacity and/or excessive container retention problems.

In conjunction with the ability to track and forecast container capacity at a given location, the system can further track and forecast container load capacity by monitoring volume, space and/or weight capacity at receiving areas such as warehouses and land fills. The system identifies the shipper, transportation vehicle identification number and the quantity or volume of the shipment. This information, when calculated using container capacity levels, can be used to project the useful life of a delivery site such as a landfill based on contractual or estimated delivery of recorded shipment volumes.

In accordance with another aspect of the invention, a shipping company, knowing the volume and/or weight capacity of containers, can integrate information provided by the system with accounts receivable and billing programs to create efficient, verifiable and accurate billing statements. Shipper's accounts receivables and/or employee payrolls can be prepared in accordance with the invention by correlating identified containers with subcontractor invoices or designated employees so that invoices and payrolls are paid only upon confirmation of actual delivery of the identified container(s).

In accordance with still another aspect of the invention, the container monitoring system uses a data warehouse model which permits other networked computers programmed in non-common languages to receive data acquired and processed by the system for maximum distribution and usage of system data.

In accordance with other aspects of the invention, a variety of communications mediums can be used to update the data in the system including but not limited to telephone, radio and portable RF scanners. Personnel responsible for physical movement of containers within a container receiving area are instructed as to the initial location of containers and instructions as to final destination (unloading points) for containers, and the container movement personnel subsequently communicate to the system operator all movement of containers and load status. In order to insure accurate

transmission of container movement and load status data, container movement personnel may be equipped with data verification modules in the form of, for example, RF scanners which scan and record bar coded information which may include container identification numbers, container locations, load status, scat codes or other identifying symbols of a carrier. Once such information has been input, the data verification module updates and corrects any defects or deficiencies in the information.

These and other aspects of the invention are described below in particularized detail with reference to the accompanying Figures.

BRIEF DESCRIPTION OF THE FIGURES

In the accompanying Figures:

FIG. 1 is a schematic diagram of the operational components of one embodiment of the container management system of the present invention;

FIG. 2 is a schematic diagram of certain computing hardware and peripheral components of one embodiment of the container monitoring system of the present invention;

FIG. 3 is an example of a container status report generated by the system;

FIG. 4 is another example of a container status report generated by the system, and

FIG. 5 is a flow diagram of processing steps of the container monitoring system of the invention, and

FIGS. 6A–6C are representative screen displays of a computer program which performs the container monitoring process of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. 1 schematically illustrates the basic physical components of one application of the container monitoring system to, for example, the movement of containers C (pulled by a carrier vehicle V) arriving, moving about, and departing from the premises of a manufacturing or assembly plant P having physical boundaries P_B. As used herein, the term "system" refers to the described method of container monitoring, and to the equipment used to execute the steps of the system. In this embodiment, the system accumulates, stores and disseminates information on containers with respect to the location of containers relative to plant boundaries P_B, locations within the plant boundaries but outside the plant referred to as receiving areas or yards Y, and docks D which are designated entrances or doors to plant P. Entry and exit to and from the plant premises is directed through and controlled by gate G. As used herein, the term "system" refers to all of the methods and apparatus of the invention used to move and monitor containers and to record, store, manipulate and transmit data relative to container monitoring.

FIG. 1 is representative of only the most basic physical arrangement of a plant and container receiving/shipping facility with which the system of the invention may be applied. For example, as further detailed below, the system is readily adaptable to facilities having complex geographic layouts, multiple plants with multiple docks and multiple entry and exit points with gates, receiving areas or yards, off-site container holding areas. One example of such adaptation is further illustrated by FIG. 1 wherein an off-plant premises remote receiving area RY is provided with its own gate RG. In this type of arrangement the physical control of the system over containers destined for interface with the plant is extended beyond the plant boundaries P_B without affecting the information acquisition and management on containers still remote from plant premises. As will be appreciated, in any adaptation the system is not limited by the type of facility or container, or by the mode of transport of containers.

As further detailed in FIG. 1, each receiving area Y is assigned a unique designator such as Y1, Y2, . . . etc. which may be associated with a dock D or group of docks also uniquely designated such as D1, D2 etc. Carriers (meaning the entities and vehicles used to convey or move containers) are uniquely identified by, for example, SCAT codes as used in the trucking industry, and truck trailer numbers such as the six digit truck container numbering convention used in the United States and the seven digit numbering convention for inter-modal type containers. To monitor other types of containers such as inter-modal ship/rail/truck containers, air freight containers, or any other type of shipping container, a similar carrier/container numbering or coding system. For example, an electronic envelope may be created to track a single container which may be carried by different carriers in different modes such as ship, train, truck or aircraft.

Once the receiving areas Y of the plant premises and the plant entrances (docks D) are uniquely designated, and all incoming carriers and containers are uniquely labelled, the system has a basic framework for monitoring, compiling and providing information for efficiently locating and controlling movement of containers from point of origin to point(s) of destination and within plant premises, as further described below.

The system monitors and records all container movement within the plant premises by tracking locations of containers made by container moving means S within the plant premises, for example, from the gate G to receiving areas Y, from remote receiving area RY to receiving areas Y, from receiving areas Y to plant entrance docks D and back to receiving areas. In the case of wheeled containers such motive means S may include tractors or trucks commonly known as switch trucks or trailer jockeys or shunters. The shunters S perform the task of physically moving containers to designated receiving areas Y or docks D according to information provided by the system and by the operations management of the plant as further described below. In other applications, shunters S may be rail-based engines, mobile cranes or hoists, aircraft, watercraft, or fixed conveyer systems, or any other mechanical motive system operative to physically move a container and/or container contents from one location to another.

Other physical facilities to which the system may analogously be applied include, for example, a land fill wherein the dumping areas of the fill constitute receiving areas within premises boundaries accessible through a gate or gates; a shipping port wherein ship docks constitute gates to receiving areas proximate the docks, and the container moving means are cranes which unload the ships; or a rail yard with adjacent warehouses or holding lots, wherein entry to the yard is controlled by track switches which act essentially as gates and the warehouses or holding lots serve as receiving areas. Air freight containers can be similarly monitored by the system by tracking carrier and flight identification numbers at an arrival airport, gate numbers and warehouse-type receiving areas of containers.

FIG. 2 schematically illustrates certain container information gathering, management and usage communication and computing equipment such as computing hardware and software connected and programmed for use with the physi-

cal arrangement of a plant and/or container shipping operation or any operation involving movement of containers. A container monitoring control system (CMCS) **10** includes, for example, a central processing unit **11** such as a mainframe or microprocessor for receiving and processing container-related data, a container monitoring system database **12**, one or more container data input terminals **14** which may be locally or remotely located from the CMCS **10**, a CMCS monitor **15**, communications links **16** to remote computing systems and/or data receiving modules such as facsimile or E-mail facilities, remote container data transceivers **18**, and one or more printers **20** for producing hard copy reports of container data acquired and processed by the CMCS. In one possible hardware arrangement of the system, one or more container data input terminals **14** and monitors **15** may be located at a gate or gates G for input of data acquired from incoming and outgoing containers into the CMCS **10**. One form of data identification and input is by a human operator at terminal **14**. Other methods and apparatus used by the container monitoring system for data transfer to and from CMCS **10** include hand held radios such as Motorola Model HT1000 which may be operated by drivers of switching trucks S to communicate to an operator at terminal **14** positions and status of containers for input of such data to the CMCS **10**. Another type of data input and confirmation device which may be used with the system is a hand held optical scanner or RF optical scanner such as the PTC 912 and PTC 912DS products of Telxon, Inc. which may be programmed to read bar codes on containers. Alternatively, remote terminal devices with a data display and input keypad, such as used in taxicab dispatch, may be provided in the switching trucks S.

The CMCS **10** is interoperable with other computing systems such as for example a management information system (MIS) of a facility to which containers are delivered (herein, "1st customer MIS" or "customer MIS"), and/or an end or intermediate customer (herein "2d customer MIS"), and/or an MIS of a container carrier business (herein "carrier MIS"). As further shown in FIG. **2**, in a preferred embodiment of the invention the CMCS **10** is commonly linked with a plant or customer MIS **30** and container carrier MIS **40** for cross exchange of container data. Of course connections could also be made to additional MISs and/or databases to further expand the accessibility of container data compiled by the CMCS **10**. As well known in the business management and computing arts, an MIS generally includes a set of data collection, analysis and reporting tools which support decision making needs. A computerized MIS generally includes a database accessible by a computer programmed with data analysis and reporting software to generate informational reports to management personnel.

A typical container monitoring sequence is now described with reference to the physical arrangement of FIG. **1** and the monitoring hardware and software described above. As a container C (pulled by a carrier vehicle V) approaches gate G of plant P, the carrier and container identifying indicia on the vehicle (for example a SCAT code) which is input to the CMCS along with a corresponding container number which appears on the exterior of the container, along with the time of arrival. The recorded time of arrival of a container starts a retention time clock to accurately measure the total amount of time a container is retained on the premises of the destination facility such as plant P. This information is critical to both carriers and customers. Container retention times recorded by the system clearly identify for carriers containers which are held for excessive amounts of time. Customers, i.e., the ultimate recipients of the container contents, who must pay carriers for excess retention time of containers can use the information provided by the system to independently verify charges from carriers for excess retention.

In a preferred method of the invention, the carrier/container combination of data for each arriving container has been transmitted from the carrier MIS to the customer MIS prior to the arrival of the container, so that as the carrier and container are identified and input to the CMCS upon arrival at plant P, and this information transmitted from the CMCS to the customer MIS and/or carrier MIS, the system performs the function of communicating confirmation that a particular container has actually arrived at a destination. Once such confirmation is provided, the system continues to monitor the container about and within the premises of plant P.

Bill of lading information may also be transmitted from the carrier MIS to the customer MIS concerning each container, so that confirmation of arrival of the container (by identifying the carrier and container number only) is sufficient to enable to customer MIS to specifically identify, for example, parts which have arrived on the premises and thus available for assembly. Although it is not necessary for the container monitoring system to know the specific contents of any particular container (as represented by an accompanying bill of lading), it is information which can be readily input to the CMCS (either by the carrier MIS, customer MIS, or through CMCS input terminal **14**) to enable confirmation of delivery of specific contents-identified containers. In other words, data of the contents of any container can be stored and associated with carrier/container identifications within the CMCS as an alternative or addition to the data contents of the customer or supplier MIS.

Shipping rates and cumulative charges associated with bills of lading may also be entered in the CMCS. This data may be correlated with an independent accounts payable program (for example resident in a customer MIS) whereby payments from a customer to a carrier can be authorized by the data from the CMCS. By this method, payments to carriers are made only for containers/goods which have actually been received or unloaded on the customer's premises. Similarly, carriers can use the delivery confirmation data provided by the system to generate bills to customers with actual confirmation that a particular delivery has been made.

As alternatives to monitoring location and status of specific contents of containers (which is contemplated by the invention), one method of the invention is to monitor the load status of any given container by using designations such as "full" or "truck load", "partial load" or "empty". Load designation conventions can be used such as labelling all incoming containers as "full" in the CMCS (regardless of whether a container is actually full) and all outgoing containers "empty", based upon indications from the customer who is responsible for unloading the container. "Partial loads" are also identified based upon information from the customer that a particular container, only partially unloaded, is to be removed from a dock and returned at a later time. Without the designation of such a container as a "partial load", the customer would have no efficient way of relocating the container when the remainder of the parts are needed, or of monitoring that the container still had parts in it and should not be allowed to leave the premises until empty. All such load status data is input to the CMCS in the manners described for transmission, by facsimile, electronic mail or through an internet or world wide web to the customer MIS and carrier MIS. Carriers are thus immediately notified when containers are empty and available for pick-up.

Also monitored by the system is cumulative load data for all incoming and outgoing containers for any particular premises or facility. By tabulating total number of container loads, the system keeps running figures on shipment volume within a premises. This data is then compared to known capacity values to evaluate and/or forecast facility utilization. One example of applicability of this aspect of the invention is to a land fill facility wherein containers are monitored by loads to continuously calculate remaining capacity of a land fill.

Associated with load status and container contents is data on part-carrying racks which fit inside containers. In certain applications of the system, monitoring of racks is equally or even more important than monitoring containers for the reason that certain parts cannot be carried in containers without specially adapted racks. For example, parts such as automobile engines cannot be shipped without empty racks being returned from an automobile assembly plant to an engine plant. Containers which hold such racks are therefore specially identified in the CMCS so that as such containers are completely unloaded, and empty racks placed back in the container, the container is specially identified as, for example, "racks outbound".

A container vehicle V or switcher S drops the container C in a receiving area Y outside or within plant boundaries P_B. The location of the initial drop off point is confirmed by communication from a remote container data transceiver **18** operated by personnel on the plant premises, such as a shunter driver, for immediate input to the CMCS. This begins the pattern of constant and immediate updating of container location and status by the CMCS to the customer MIS which enables the customer MIS to locate shipments without any searching or delay. The customer provides instructions on which containers are needed at which docks, i.e., switching instructions. Switching instructions may be generated by the customer MIS and delivered to operators of the switchers S or transmitted to the CMCS for communication to switchers S via remote data transceivers **18**. Switching instructions are carried out by operators of switchers S which, in the example of a trucking operation, hook-up to a container such as a trailer and move it from a receiving area to the specified dock. The new location of the container is again reported to the CMCS in the form of a dock or gate number for updating of data on that container in the CMCS database. The amount of time the container remains at the dock is counted in the running retention time clock.

Subsequent container switching instructions received from the customer, for example to remove a container from a dock and return it to a yard, are similarly conveyed and executed by switchers S and reported for updating the CMCS database. The data of course includes the location of the container. Load status of a container is also updated according to information provided by the customer. For example, a container which is partially unloaded and then instructed to be returned to a receiving or holding area is noted in the system as a "partial load". The container is thus readily identifiable when instructed to be returned to continue unloading. In the instance where a single container is switched between a yard and dock or docks multiple times before leaving the premises, the system records each switching operation. This information is useful to the customer to identify excessive switching which indicates production or distribution process inefficiency. Because the system continuously tracks the location and status of all containers on the premises at all times, calculations can be made to determine available capacity for receiving additional containers. This includes calculations for one time deliveries such as to land fills.

Once a container is completely empty and returned to a yard, it is recorded in the CMCS database and reported to the carrier as empty and ready for departure from the premises. In order to communicate all of the data acquired by the CMCS relative to container location and status, including arrival and retention times and load status, the system is able to generate reports of container activity in any desired format for the benefit of all customers and all carriers delivering containers to customers. For example, as represented by FIG. **3**, a "Detail on Hand" report **100** may be generated by the CMCS in any particular format such as columns and rows in which carriers and containers are listed with accompanying status data such as date and time of arrival, yard location and load status. In column **1** are listed carrier identifications such as SCAT codes for trucks. Column **2** identifies each carrier by full or abbreviated name. Column **3** lists the date of arrival of each container, and in column **4** is listed the time of arrival. In column **5** is listed the dock or docks at which a container is or was last unloaded. And in column **6** the current yard location of each container is listed. In column **7** is noted the status of the container load, which may include notations empty racks such as "racks outbound". Column **8** lists the container number which corresponds to the carrier. And column **9** is provided for entry of load-specific data such as contents identification and quantities and any other load data as may be included on, for example, a master packing list. The load specific data is critical to customers who pay suppliers on a "paid-on-production" system whereby suppliers are paid only upon assembly of parts into a finished product. By knowing that a certain shipment of parts actually arrived at the plant, and that the container left the plant in an empty state, the system provides the customer with independent verification for authorization of payments to suppliers. The load specific data may further include data on racks in containers. Since a load of racks will have a freight bill identifying the number and type of racks and destination, all of this information can be readily input to the CMCS, and set forth in column **9** of the report, to expedite the return of empty racks to a parts production facility.

The report of FIG. **3** is organized by carrier over a period of calendar days. Other report formats which the system may generate may be according to certain yards or receiving areas, times of arrival, unloading docks, container numbers for certain carriers, or load status. For example, report **120** as depicted in FIG. **4**, is compiled as an "Empty Trailer Report" listing only trailer containers which are completely empty and ready for departure from the premises. This type of report is most valuable to carriers wanting to retrieve containers from the customer's premises as soon as possible. The report is also valuable to the customer for verifying over-retention charges by carriers. In this format, the carrier and containers are identified in column **1**, the unloading dock in column **2**, the current yard location in column **3**, and the initial load type in column **4**. A "packing list" column **5** is provided for entry of specific data on the contents of a container as described above. The figures in column **6** represent a total amount of time a container has been on the premises from the time of arrival to the time the report was generated. And column **7** is provided as a flag field for time measurements in column **6** which indicate containers "past due" for pick up.

FIG. **5** schematically illustrates one processing flow for monitoring containers in accordance with the invention, which steps may preferably be performed by an appropri-

ately programmed computer such as the CMCS. The computer program generates screen displays for presentation on a connected monitor to an operator of the system. The screen displays provide graphical and/or tabulat or spread sheet type formats for entry and verification of container data, and control menus for accessing different types of information on containers in the system.

The process begins at step **0**, proceeding to step **100** to determine arrival of a container. Step **200** insures that each arriving container is uniquely identified by the system. FIGS. **6A–6C** are representative of types of screen displays which may be generated by the CMCS computer program for input and display of container information at a CMCS monitor. For example, a screen display such as FIG. **6A** provides a format for a container identification header to be created at step **300**. The header is used as a virtual data envelope by and through which all data relevant to an identified container is accessible, transferrable, manipulable. An arrival record is created at step **400**. Step **500** is provided to accommodate containers which must be immediately "spotted" or moved to yard or dock, for example based upon information received from the customer MIS identifying "hot" loads. In lieu of an immediate spot, arriving containers are spotted to a yard at step **600** and the header record updated at step **700** with yard location, which may also include a subdesignation of a parking spot within a yard. FIG. **6B** is a trailer spot update input screen display. At step **1000**, loaded containers are summoned to a receiving dock, based upon instructions received from the customer, the header record for the summoned container located at step **1100** such as by inputting container identification via the input screen display of FIG. **6C**, with intermediate error correction steps **1200** and **1300**, and a container spot or transfer performed and similarly updated to the system at steps **600** and **700**. Containers departing from the premises are monitored at step **1400** which again requires locating the corresponding header record at step **1500** via screen display of FIG. **6C**, with error correction for no data match at steps **1600** and **1700**, the departure of containers input and updated to the system at steps **1800** and **1900**. By performing these steps in connection with the CMCS programmed to follow and prompt users through the sequence, and by controlling the plant entry points and premises, the system maintains accurate records of identification, location and load status of all containers on the premises and the amount of time containers are on the premises.

What is claimed is:

1. A container monitoring system for accumulating and storing information on shipping containers including container location and container load status, the system comprising:

a receiving area for receiving containers to be monitored by the system, said receiving area within a defined boundary within which containers are to be monitored by the system,

a container entry point at the boundary at which containers are identified by pre-existing identification codes which are recorded at the container entry point,

a switching vehicle for moving containers to and from a receiving area and to and from a facility within the boundary according to instructions received from the facility, and

means for recording information on locations and load status of containers within the defined boundary.

2. The container monitoring system of claim **1** further comprising a container monitoring control system for receiving, storing and reproducing carrier and container identification codes and container location data.

3. The container monitoring system of claim **2** further comprising a communications link between the container monitoring control system and a customer management information system whereby the customer management information system can receive container identification and location data from the container monitoring control system.

4. The container monitoring system of claim **2** further comprising a communications link between the container monitoring control system and a carrier management information system, whereby a carrier management information system can receive container identification and location data from the container monitoring control system.

5. The container monitoring system of claim **1** wherein the container monitoring control system and a data entry terminal connected to the container monitoring control system is located at the code identification and container entry point.

6. The container monitoring system of claim **1** wherein the receiving area is within the boundary.

7. The container monitoring system of claim **1** wherein the receiving area is outside the boundary.

8. The container monitoring system of claim **2** further comprising mobile telecommunications means associated with the switching vehicle whereby movements of containers by the switching vehicle are communicated to the container monitoring control system via the mobile telecommunications means.

9. A method for monitoring location and load status of shipping containers comprising the steps of:

identifying carriers and containers by identification codes at a point of entry to a facility,

recording identification codes of containers to be monitored,

moving a container from the point of entry to a receiving area and recording the location of the container within the receiving area,

moving a container from a receiving area via a switching vehicle to a final destination according to instructions received from the facility and recording the location of the final destination of the container,

moving the container from the final destination to a receiving area and recording the receiving area location of the container and the status of a load in the container.

10. The method of claim **9** further comprising the steps of recording an empty load status of a container.

11. The method of claim **10** further comprising the step of reporting an empty load status of a container to a corer associated with an empty container.

12. The method of claim **9** further comprising the step of defining a boundary within which containers are monitored and identifying containers at a point of entry located at the defined boundary.

13. The method of claim **9** further comprising the steps of moving a container from a receiving area back to a final destination and back to a receiving area and recording all moves of the container between a receiving area and a final destination.

14. The method of claim **9** further comprising the step of communicating information on all movement of a container to and from receiving areas and final destinations from a container movement vehicle to a container monitor control system.

15. The method of claim **9** further comprising the step of monitoring load status of a container at receiving areas and final destinations.

16. The method of claim 9 further comprising the step of recording container information on container location and load status by entry of data into a container monitor control system.

17. The method of claim 9 further comprising the step of verifying recorded container locations in receiving areas.

18. The method of claim 9 further comprising the step of monitoring racks within containers.

19. The method of claim 9 further comprising the step of generating reports which contain information recorded on monitored containers.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,712,789
DATED : Jan. 27, 1998
INVENTOR(S) : Joseph E. Radican

It is certified that error appears in the above-indentified patent and that said Letters Patent is hereby corrected as shown below:

col. 10, line 49, claim 11
"corer" should be "carrier"

Signed and Sealed this

Fourteenth Day of July, 1998

Bruce Lehman

Attest:

Attesting Officer

BRUCE LEHMAN

Commissioner of Patents and Trademarks

PROOF OF SERVICE

I, David P. Swenson, being duly sworn according to law and being over the age of 18, upon my oath depose and say that:

On **17 July 2015** I electronically filed the foregoing **Plaintiff-Appellant Wireless Media Innovations, LLC's Appeal Brief** with the Clerk of Court using the CM/ECF System, which will serve via e-mail notice of such filing to all counsel registered as CM/ECF users, including any of the following:

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Electronic copies will be sent directly to the above counsel at the time paper copies are sent to the Court.

Upon acceptance by the Court of the e-filed document, six paper copies will be filed with the Court, within the time provided in the Court's rules.

17 July 2015 /s/ *David P. Swenson*
David P. Swenson

CERTIFICATE OF COMPLIANCE

This brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 32(a)(7)(B), because it contains 7,104 words, excluding the parts of the brief exempted by Federal Rule of Appellate Procedure 32(a)(7)(B)(iii) and Federal Circuit Rule 32(b). This brief also complies with the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5) and the type style requirements of Federal Rule of Appellate Procedure 32(a)(6), because it has been prepared in a proportionally spaced typeface using Microsoft Word 2010 in Times New Roman 14 point font.

17 July 2015

/s/ *David P. Swenson*
David P. Swenson